

The **future** of **interactive** entertainment

UK edition **April** 1995 **£three** ¥2100 $ten

Sony ■ Sega ■ Nintendo ■ 3DO ■ PC ■ Amiga ■ Atari ■ SNK ■ Arcade ■ NEC ■ CD-i

Voted **Magazine of the year**

INDIN

Industry awards

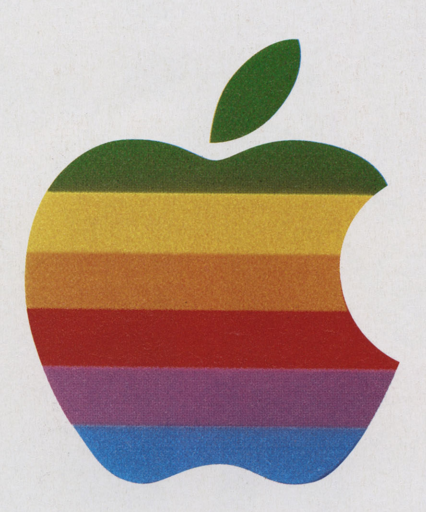
Apple Computer has never played by the rules. Founded by a pair of technohippies in 1976, it eschewed the corporate ideology of IBM yet within a decade was its biggest rival. Edge bites into the company that made computers friendly



Issue **nineteen** **19**




EDGE



The end of an era: crunch time for Apple

Apple's decision to open up its operating system to thirdparty hardware manufacturers is momentous for two reasons. First, because this is a company that has fought fiercely for many years to maintain its individuality. Now the graphical user interface that made Apple computers unique will for the first time be seen running on non-Apple boxes.

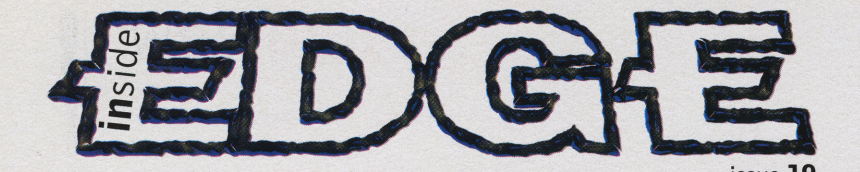
But more significantly, the change is a response to the new trend in the computer market towards breaking down the barriers of incompatibility. Apple will now adopt the multi-manufacturer approach that has characterised the PC market for years and is now being applied to other systems, notably the 3DO and the Saturn.

Apple's decision to join the PowerPC consortium has ushered in a new era of glasnost. For years, the company was at daggers drawn with IBM's 'Evil Empire'. Who would have thought that Apple and IBM would now not only be talking to each other but would have a common business interest?

The new policy certainly makes commercial sense. Apple has done well in the education and DTP markets but has failed to make an impact in the business sector. The hegemony of the PC was unlikely to be broken, and the release of *Windows 95* – with many 'Macintosh' features – would have led to further encroachment on Apple's market. Apple had to ensure that the Mac OS was out there competing with *Windows* on as many machines as possible.

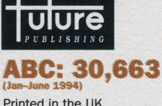
But many loyal Macintosh owners will feel that Apple has sold out.

The **future** is almost here...



issue 19





ABC: 30,663
(Jan–June 1994)
Printed in the UK

Contacts

Editorial

Future Publishing
30 Monmouth Street
Bath BA1 2BW

Telephone 01225 442244
Fax 01225 338236
E-mail edge@futurenet.co.uk

Subscriptions

Future Publishing Ltd
FREEPOST BS4900, Somerton
Somerset TA11 7BR
Tel Customer services: 01225 822510
Customer order line: 01225 822511
Fax 01458 274378

The annual subscription rate for one year is:
UK £36 (£32 direct debit), post free; Europe £63; rest of world £92
Overseas distribution:
Future Publishing 1225 442244

People on Edge

Jason Brookes editor
Jez Bridgeman art editor
Ceri Vines production editor
James Flynn writer
Tony Mott writer
Terry Stokes art assistant

Steve Jarratt consultant editor
Nicolas di Costanzo Tokyo bureau

Dominic Beaven advertising manager
Graham Clarke business development
Guy Bartlett account manager
Lydia Milsom sales executive
Advertising fax 01225 480325
Craig Broadbridge production coordinator
Richard Gingell production manager
Production fax 01225 423118
Cathy McKinnon ad design
Claire Thomas production controller
Judith Green group prod. manager
Jon Moore pre-press services co-ordinator
Simon Windsor colour scanning and manipulation
Chris Stocker colour scanning and manipulation
Simon Chittenden mono scanning
Mark Gover pre-press services
Jason Titley pre-press services
Oliver Gibbs pre-press services
Colin Campbell publisher
Greg Ingham joint managing director
Nick Alexander chairman

Colour reproduction

Colourworks Repro, Bristol
Phoenix Repro, Bristol

Print

Cradley Print,
Warley, West Midlands
Edge is printed on Royal Press 90 gsm

Production of Edge

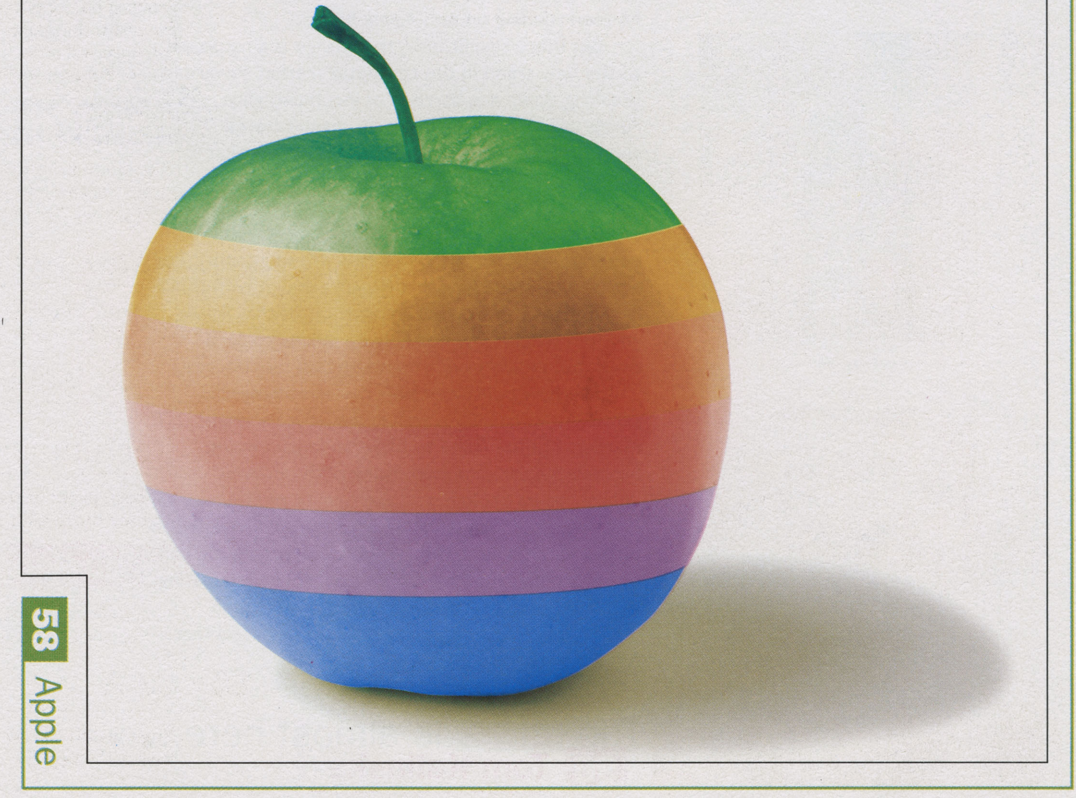
Hardware: Power Macintosh, PowerBook, IIsi and Classic by Apple
Software: Quark*XPress*, Adobe *Photoshop*, Pixar *Typestry*, Aldus *Freehand* and *Nisus*
Typography: (Adobe®)
ITC Franklin Gothic/**Heavy**
Bell Gothic Light/**Black**
Gill Sans/**Bold**
Fifth colour: Pantone® 802c

Cover

Cover image: Crunch time for Apple
Graphic manipulation: Simon Windsor

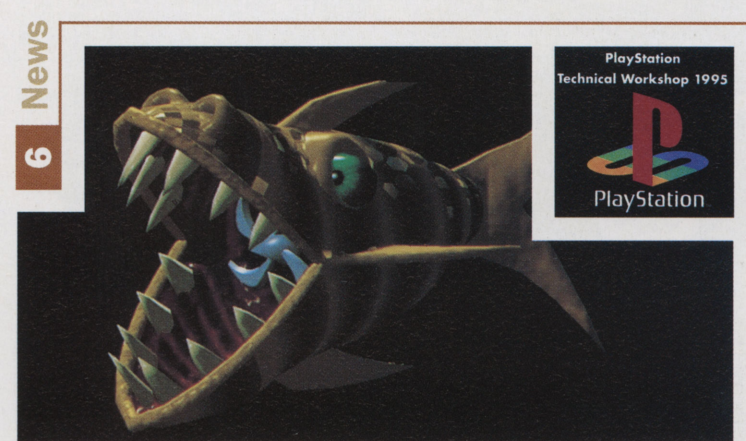


Photography: **Stuart Whale**



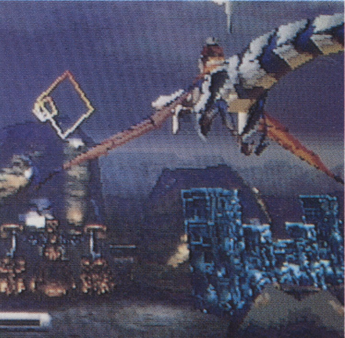
insideview

6 News



Tao Systems' new coin-op, *Spyfish* (main); **Sony**'s PlayStation Technical Workshop (inset)

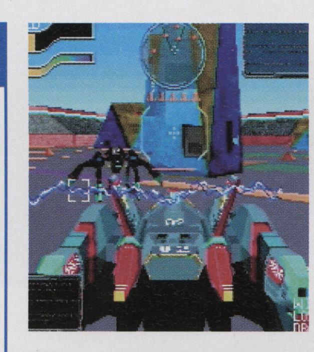
27 Prescreen

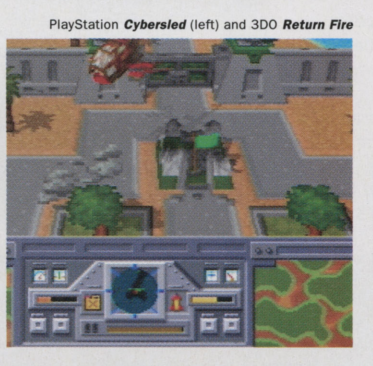


Saturn ***Daytona USA*** (left) and ***Panzer Dragoon***

67 Testscreen

PlayStation ***Cybersled*** (left) and 3DO ***Return Fire***







Photography: **Mark Koehler**

96 Tom Kalinske



The latest **news** from the world of interactive entertainment

Sony goes public for UK developers

The UK industry watches as Sony finally reveals its ambitions for the PlayStation





Just over a year ago, a select band of developers gathered in London for their first glimpse of Sony's secret PS-X hardware project (**Edge** 9). 12 months later, the PlayStation is onsale in Japan, over 700 development systems have been shipped worldwide and the future looks formidable for Sony's format.

To celebrate its achievements so far, and to instil further confidence in the PlayStation among the games community, the newly inaugurated Sony Computer Entertainment Europe (SCEE) recently hosted another industry gathering – this time a grander, more public affair held at the Royal Lancaster Hotel in London. The PlayStation Technical Workshop, as it was called, was well attended, with over 600 developers, retailers and corporate head honchos packed sardine-fashion into the hotel's reception area while Sony prepared itself for its presentations.

Unfortunately, the conference offered few revelations. To the disappointment of retailers, the UK price was not divulged (although a figure of £300, including an in-pack game, got the best odds), nor was there a firm launch date. These announcements are being saved for the Spring ECTS in late March. Similarly, most of the graphic demos shown had been seen on numerous occasions by the majority of the people attending and there were no sneak previews of forthcoming games.

However, this was many people's first opportunity to get to grips with *Ridge Racer*, *Toh Shin Den* and *Parodius Deluxe*, which were running on a dozen or so Japanese PlayStations. →



Sony put on an impressive display (above). A panel of SCE execs (left) faced questions from any who remained unconvinced









Sony's talkmen (clockwise from top left): hardware supremo Ken Kutaragi; Teruhisa Tokunaka, SCE Japan's deputy president; SEP's global boss Olaf Olaffson; and newly drafted SCEE chief Chris Deering





SCEE's Phil Harrison (above). Edge provided a PlayStation brochure for the event (top)

➔ And a few people whose birthdays coincided with the Technical Workshop were lucky enough to walk away with free machines.

The workshop's keynote speech came from joint MD of Sony Electronic Publishing Europe, Ian Hetherington, who expounded on Sony's virtues – its position in the market, its established distribution channels and its raw marketing power – while also outlining the competition's main faults.

Hetherington claimed that the Saturn has an awkward development system and was being diluted by the appearance of interim products like the 32X/Neptune, and that Sega is having trouble shedding the 'market baggage' of the Mega Drive/*Sonic* years.

Nintendo was also given short shrift because of its treatment of thirdparty developers, lack of visible new technology, and ambivalence to CD. 3DO came off no better, thanks to its inferior technology, poor software and an adherence to what Hetherington termed the 'multimedia graveyard'.

The PC, however, is viewed as an important extension of the PlayStation's market. The machines have similar specifications, their common language is C and the PC is increasingly CD-based. PCs are often used as development stations for PlayStation software, and many libraries and APIs (Application Program Interfaces) can be used for both systems. It makes sound financial sense if a developer can write for the PlayStation and then convert to a PC CD-ROM version with the minimum of time and effort. And the fact that the PC has 35% of the entire games market provides a significant incentive to develop for Sony's machine.

Corporate weight was added to the occasion by the appearance of **Teruhisa Tokunaka**, the deputy president of SCE in Japan, who revealed that 300,000 PlayStations plus 1.15 million games had been sold by the end of December in Japan (see page 10). The number of titles bought by each PlayStation owner has risen from an average of 2.3 to 3.7 with the release of *Toh Shin Den* and the second wave of software.

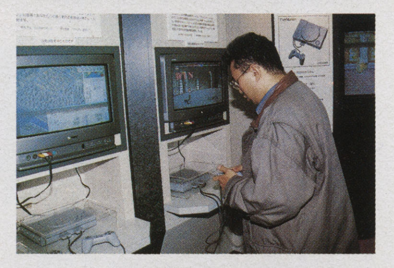
He went on to state that choosing CD as the PlayStation storage medium was the single most important decision made by Sony. 'PlayStation CD-ROM is like a MacDonald's hamburger,' he quipped. 'Quick, cheap, tasty and easy to get another.' This was a reference to Sony's new Repeat Order System, whereby retailers don't have to carry excess inventory. And unlike cartridges, CDs can be manufactured quickly to fill demand as it occurs.

Although less enlightening than expected, the workshop did at least emphasise that PlayStation is on its way to the UK. In most cases Sony were preaching to the converted, but the few PlayStation initiates who attended went away with plenty to think about. E

Who is it?

This man created one of the most successful and notoriously addictive games in history. He developed it during office hours at his day job and received no official payment or royalties when it was released commercially





Sony Computer Entertainment has held many PlayStation conferences in Japan (above), but Sony's London event was the first of its kind in the UK

Nintendo aims high with ‘Satellaview’

SFC owners will soon be able to download games via satellite

it is...

Alexey Pajitnov, the Russian author of *Tetris*. His employers, the Computer Centre of the Moscow Academy Of Science, a government R&D lab, denied him a potential fortune. He did get an IBM PC, though...

Ultra 64 takes on talent

Nintendo is recruiting games development teams for the Ultra 64 due to be released in Japan at the end of this year (advert below). The company is looking for ‘undiscovered



talents’, specifically, programmers, game design and animation experts, graphics specialists, producers and playtesters. Ominously, Nintendo is particularly interested in people who have been involved with games projects that have been previously cancelled. Bearing in mind that most worthwhile titles require 12-18 months development time (there is now only nine months to go) the time left until launch will probably not be stress-free.

Nintendo has announced a satellite link-up facility for the Super Famicom in Japan. The ‘Satellaview’ is planned as an add-on for the aging 16bit console, and will exploit the St GIGA satellite channel together with facilities provided by custom hardware to provide educational and leisure software.

Nintendo initiated the project with the acquisition of a Japanese satellite company last year. The ‘Super Famicom Broadcasting’ programme will kick off in March with selected demos, game tips and forthcoming attractions. Nintendo is stressing that the channel is adult-oriented and that videogames will constitute only a small component of its airtime.

To receive the broadcasts, SFC owners will need a separate Satellaview upgrade box which will plug into the small expansion slot on the base of the machine. Inside the box is 1Mb of ROM (containing the operating system) and 512K of RAM to boost the SFC’s paltry onboard memory. The unit will be packaged with its own power relay unit, a custom AC adaptor and an AV selector. Users will need a tuner and a parabolic antenna to actually receive the satellite signal, but many TV sets in Japan already have this equipment built in.

The whole setup will cost around ¥14,000 (£100). A subscription to the St GIGA satellite’s BS-5 channel will also be required, but the cost of this is likely to be nominal. The actual Super Famicom Broadcasting session (which takes place daily from 4-7pm) will be unencrypted, which means that games will be free to download. Instead, Nintendo will run the system like a commercial television station, selling ads to companies and arranging for sponsors for events.

Nintendo hopes to sell around two million units of the system in its first year onsale, even though it will only be available by mail order. It has already announced plans for accessories, including a 1Mb flash memory card (which looks rather like a Game Boy cartridge) to supplement the base unit, which has only 256K of save-game memory. The retail price has yet to be confirmed, but the card’s large storage capacity means that gamers who need extra memory should only have to buy one.

The only two firms known to be supplying games for the system so far are Nintendo and Square (which →



The Satellaview allows access to Nintendo’s new SFC broadcast channel



The base unit. The slot at the top right provides the connection

Playing by numbers

Nintendo is not the only company setting up long-distance multiplayer gaming systems. For example, Catapult's X-Band and AT&T's The Edge allow Mega Drive owners to play with friends by telephone. Systems like these have the most potential in the US, where local calls are free and cable networks are widespread. In the UK, where neither of these factors is present, they are unlikely to gain a foothold.



The memory carts are about the same size as a Game Boy cart

→ is 20% owned by Nintendo). However, Atlas, Konami, Taito and Data East are also considering developing for it. The possibility of multiplayer versions of Square's celebrated RPGs may well prove irresistible to the Japanese.

Nintendo is hoping that its satellite venture will help calm fears that the dominant force in the industry is stagnating. The Virtual Boy has not been particularly well-received, and there have also been doubts about the state of the Ultra 64 deal with Silicon Graphics. Falling profits on SFC software and hardware means that Nintendo is now on the defensive. The Satellaview will be seen by many as Nintendo's chance to redeem itself. However, others will interpret it as a sign of desperation. E

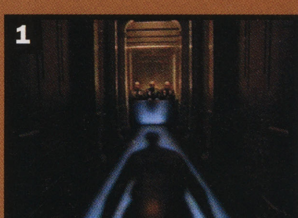


What is happening inside Nintendo's Kyoto HQ? The company may be launching Satellaview, but there's little sign of the Ultra 64 yet

Advertainment

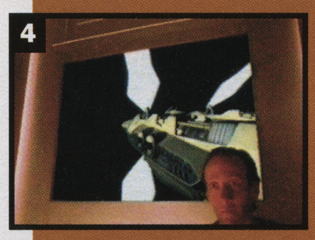
In its occasional series on the art of videogames marketing, Edge looks at the Japanese TV commercial for the PC-FX

Company: **NEC**
Product: **PC-FX**
Date: **Dec 1994**
Origin: **Japan**

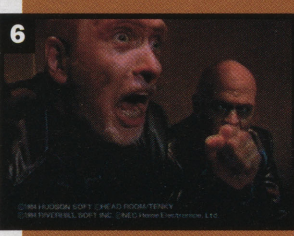














1 The opening scene is a long, darkened room, dominated by a trio of bald, leather-jacketed examiners. 2 The head examiner shouts 'Next!' and instructs the approaching candidate to 'Do it!' 3 The candidate sets down the PC-FX, closes the lid, and the machine kicks into action. 4 The video wall behind him displays the intro to *Team Innocent*, one of the first titles for the system. 5 The examiners are tentative at first... 6 But it isn't long before their excitement explodes. 7 The ad ends with a picture of the product and the release date.

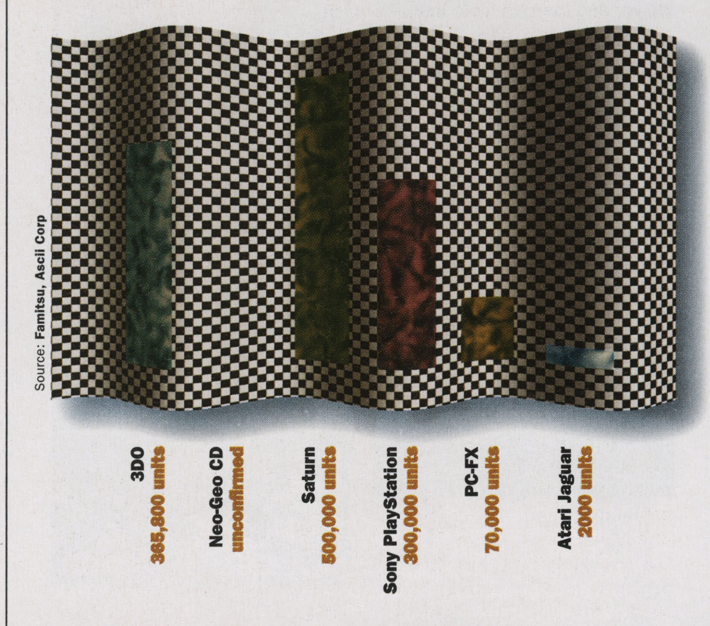
Japanese stats give Saturn the edge

New consumer figures show that the PlayStation is running second to Saturn in Japan

The latest Japanese statistics reveal that the Saturn easily outsold all its rivals in the crucial Christmas season. It appears that despite the technical superiority of the PlayStation, *Virtua Fighter* has got a firm grip on the nation's wallets.

By the end of December, the Saturn had sold 500,000 units at ¥44,800 each (this figure includes 50,000 JVC V-Saturns), against 300,000 units at ¥39,800 for the PlayStation. This equates to the Saturn shifting an average number of 17,241 units a day and the PlayStation 15,789. (The Saturn was released on November 22 and the PlayStation on December 3.)

Other machines have fared surprisingly well considering the strength of the opposition. NEC's PC-FX (successor to the much loved but now obsolete PC Engine) sold an amazing 70,000 units in the week it went on sale before New Year, despite its higher price of ¥49,800. The Neo-Geo CD has also done spectacularly well (over 100,000 units according to sources), although SNK has yet to release official sales figures.





The staggering success of Sega's Japanese Saturn launch has proved more than a match for Sony. The queues in late November (above)

The 3DO's performance was perhaps the most surprising, at least in terms of overall sales. By the end of 1994 there were 365,000 units in Japanese homes. Many of these sales were over the Christmas period, thanks to the excellent *Super SFIIX*. However, the 3DO, which was launched on March 20, 1994, has been onsale for far longer than the Saturn or PlayStation, and its average daily sales amount to a meagre 1460.

Unbelievably, there's already a second-hand market for next-gen machines in Japan. With the exception of the 3DO, prices are holding firm, so Saturn owners who feel that their machine is already passé can trade it in for not much less than they paid for it. However, PlayStations are virtually impossible to pick up second-hand as Sony is allegedly discouraging re-selling.

In the light of these figures, all the major hardware companies have announced their sales targets for 1995. Sega is hoping to have 1.5 million more Saturns in Japanese homes by Christmas 1995, with an additional 180,000 predicted by JVC.

Sony, evidently less bullish about demand for its machine, is being more →

Jag jets east

Atari is not noted for its strength in Japan, and the Jaguar's recent introduction in the Far East is unlikely to change this situation.

At ¥29,800 (£190), the Jaguar costs less than most of its competitors. However, since only 2000 units were sold before Christmas it seems unlikely that Japan will help Atari to realise its forecast of 2,000,000 Jaguars sold worldwide by the end of 1995...

Most wanted machines

The hugely popular Japanese games weekly Famicom Tsushin recently asked its 750,000 readers which machines they intended to buy. The results were:

- **PlayStation: 41%**
- **Saturn: 22%**
- **Neo-Geo CD: 12%**
- **PC-FX: 9%**
- **Super 32X: 7%**
- **3DO: 6%**
- **Other: 3%**

Incidentally, 22% of the magazine's staff claimed that, if faced with the choice themselves, they would opt for the Saturn, while just 18% favoured the PlayStation. But a full 40% said they wouldn't buy any new machine...





Saturn owners faced a choice of five games on day one. The lack of available titles was played down with displays of dummy cases (right)

→ conservative, forecasting sales of only 700,000 for the rest of the year. This figure is likely to be exceeded, though, because the machine is now selling faster than it was in 1994.

3DO, in a mood of determined optimism as it repeatedly fails to meet sales targets, has set itself the ambitious task of selling 1,105,000 units this year. It's now possible to buy an FZ10 in Japan for as little as ¥31,000 (£200).

The consumer frenzy that took place in Japan during November and December has obviously now settled down, and more reliable indications of the overall state of affairs will appear over the coming months. E

What is it?

In the early to mid-1980s, this international hardware standard – a sort of forerunner to 3DO – was licensed to various Japanese hardware manufacturers including Panasonic, Sony and Mitsubishi

In the **black**: Europe gets new-look **Saturn**

Sega has decided that the Saturn is just too grey for Euro consumers

Keen to dispel rumours that the Saturn is a distant relation in the Sega family, Sega Europe has unveiled a mock-up of the European version of the machine. Although identical in spec to the Japanese console, it has a new sleek black finish that is obviously designed to position it as the successor to the Mega Drive, despite Sega's intention to market it as an expensive multimedia/gaming system.

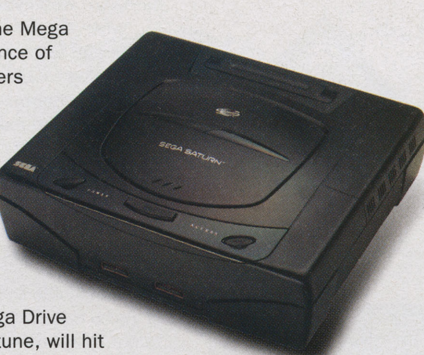
UK software will not be compatible with the US and Japanese versions of the Saturn, although whether the encryption will be as foolproof as the PlayStation's isn't known (even the multi-out RGB socket in Sony's system is encrypted to prevent thirdparty leads appearing). A fullscreen display has not been ruled out either.

What is certain is that Sega has plans to alter the look and feel of the system's pads. The Mega Drive-derived appearance of the Japanese controllers will be changed to make them more ergonomic, although the buttons will retain the same functions.

Sega has also confirmed that its all-in-one 32X-and-Mega Drive unit, codenamed Neptune, will hit the UK in the summer. It will be compatible with all existing Mega Drive and 32X carts, and the Mega CD.

The Neptune's projected price of £200 will make it the most affordable 32bit system on the market, but lukewarm 32X sales (around 20,000 since its introduction in late November) must cast doubt over the system's potential. Its biggest rival, the flagging Atari Jaguar, is expected to drop in price to £150 shortly.

Sega plans to bolster sales of the 32X through exciting new software. A conversion of *Virtua Fighter* is slated for the autumn. E



Saturn's new livery for the European and American markets is a definite improvement over the slate-grey Japanese model



The Neptune is Sega's all-in-one 32X/Mega Drive combo. *Virtua Fighter* (top) is 32X-bound

Parallel technology enters VRcades

A British codeshop is taking on the big Japanese arcade companies

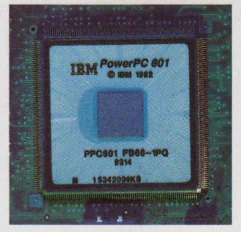
It is...
MSX. Although companies such as Konami released some excellent cartridge software for it, this open home computer system failed to gather any real following outside Japan, where it is still used today

Tao Systems – the company behind the revolutionary *Taos* operating system debuted in **Edge** 9 – is aiming to push back the boundaries of high-end arcade and VR systems. The UK company is in the process of designing both its own hardware architecture – based, unsurprisingly, on its own global parallel operating system, *Taos* – and its first game, which will appear in arcades and VR centres in late 1995.

Tao Systems describes *Spyfish* – an underwater action adventure – as the 'highest specification arcade and virtual reality game system and engine'. Curiously, though, instead of using the conventional Japanese approach of investing in the development of custom silicon, Tao Systems has approached its first game in a radically different way by basing it on standard, off-the-shelf chips. The basic design and coding of the game was actually started before the hardware was even considered.

'When we set out we were more concerned with what type of game we were going to end up with,' recalls Tao Systems' chairman **Francis Charig**. 'We didn't worry so much about the hardware. In fact, at the time the chips we've now chosen to go with didn't actually exist!'





Spyfish's *minimum* specification contains four PowerPCs and four GLINT chips

This unusual approach was made possible by the unique attributes of *Taos*. Because of the way *Taos* works, it's possible to write portable code that will run efficiently across a variety of different architectures. It enabled the company to design a low-cost, high-specification arcade board using a range of proprietory technologies running in parallel.

At the core of the system is an Intel Pentium motherboard with four fully populated PCI slots. Each PCI card will incorporate a 100MHz Motorola PowerPC chip and a 50MHz 3Dlabs GLINT processor (see **Edge** 15), and handle a quarter of the screen. Tao's . target is a 24bit colour display running at a minimum resolution of 640x480 and generating between 500,000 and 1.2 million polygons per second at a rate of 50 frames per second.

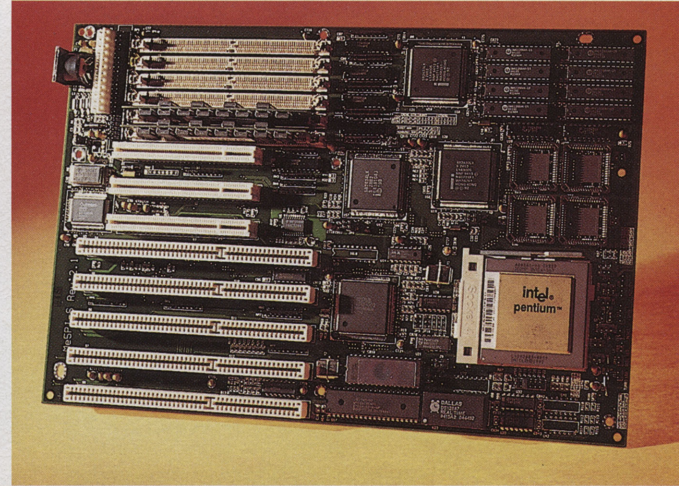


***Spyfish* is Tao Systems' first foray into the arcades. The finished game will shift over one million polygons per second in realtime**

According to Tao, the PowerPC was chosen because of its proficiency at handling floating-point arithmetic, while the GLINT chip has an unbeatable price/performance ratio. But co-technical director **Chris Hinsley** admits: 'The polygon rate will depend on which version of the GLINT chip we use. At the moment only the SX version of the chip is available, but when the TX version arrives [later this year] the →




The parallel architecture of Tao's arcade system features four PowerPC chips and four GLINT chips – seriously powerful kit



Tao Systems has chosen a Pentium motherboard (it's cheap) with four PCI slots to form the basis of its arcade system (PC motherboard above)

What is *Taos*?

Taos is a global, heterogeneous, parallel-processing operating system. Unlike most code, which has to be recompiled to run on different chips, code that is written in *Taos* is portable and can run across dissimilar architectures. It works by using a 'virtual processor' that translates binaries on the fly into native code suited to individual processors.

In theory, this means that it's possible to run code across a Pentium, a 68000, and even a Hitachi SH-2, exploiting each chip's strengths, with minimum speed overheads. For more information, see Edge 9.

→ chip will let us bump up the number of textured polygons to more than a million a second.'

Spyfish uses a large graphics database and therefore requires a lot of memory. Tao is currently designing the PCI cards (in cooperation with a UK company called Firefly) to enable each PowerPC chip to access a vast 32 megabytes of private EDRAM (faster then DRAM), while the GLINT chip will be able to call on up to 32 megabytes of local buffer RAM and, if necessary, as much as 32 megabytes of VRAM. The PowerPCs will handle all the geometry calculations while the GLINT chips take on the back-end rendering.

There's no shortage of RAM on the Pentium motherboard, either. Tao estimates that the board will have between 28 and 64 megabytes to store the game logic and feed the PCI cards with position information. As far as hard storage is concerned, Tao anticipates that both a gigabyte hard disk and a CD-ROM drive will be included in the machine.

'From a purely technical point of view, the system we've created exceeds anything that exists at the moment,' assert Charig. 'But because we're simply taking off-the-shelf components, we're ending up with a box that's costing no more than anybody else's.'

Of course, great hardware is meaningless without an entertaining game. At its most basic level, *Spyfish* can be described as a high-end action arcade game, but both Hinsley and co-technical director **Tim Moore** firmly believe that today's high-end arcade and VR experiences are lacking many of the qualities that older computer games used to exude.

'When I look at most new games I don't see any new ideas,' says Moore. 'What we're trying to do is create a game that's exciting to play, that fits the mould of a traditional arcade game, but has some of those other elements such as humour and strategy. For example, there will be places in the game where if you go in with all guns blazing you won't succeed.'

As well as the standard arcade version of *Spyfish*, Tao Systems is planning a VR version which will achieve the greater performance needed for stereoscopic visuals (Tao is working with HMD specialist Forte on the display technology) simply by doubling the specification: one motherboard (each with the four PowerPC/GLINT-equipped PCI cards) will be used for each eye.

Two of Tao Systems' prime movers, Tim Moore (left) and Francis Charig (right)







A pre-rendered conceptual demo provides a glimpse of *Spyfish*'s 'search and destroy' action

Continued next page

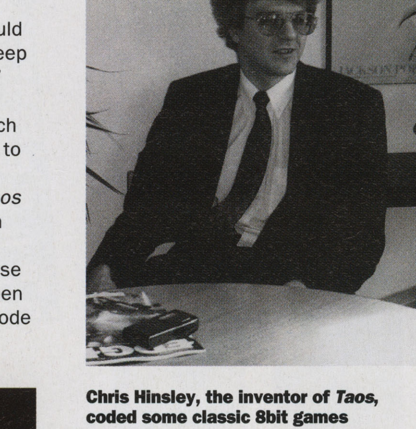
Continued

'Even with this kind of set-up we're ending up with something that's no more expensive than a low-end Virtuality system,' claims Charig. 'Such is the nature of *Taos*, we could keep adding more processors to keep the spec right at the leading edge.' The company is also planning a multi-user version of the game which will take advantage of *Taos*' ability to address multiple processors.

A wider ramification of using *Taos* code is that both *Spyfish*'s polygon engine and its game engine will be reusable for future projects. Because of the way that *Spyfish* that has been developed, the game engine (the code that manipulates objects and backgrounds and calculates collision, etc) is completely separate from the image-generation routines. To capitalise on this, Tao intends to package the image generator with the next release of *Taos*, so people can write to that interface themselves. *Taos* could be used to port games onto consoles like the PlayStation and Saturn, and the arrival of other custom polygon chips later in the year means that the route into the arcades could become even easier for developers. As long as they use *Taos*, of course.

Although nothing can be confirmed at this stage, Tao Systems is currently in discussion with various arcade manufacturers. The first demonstration of the game (a basic version possibly using just a single PowerPC chip) will take place on the Motorola PowerPC stand at the Hanover CeBIT show, March 8-15.

Tao Systems can be contacted on 0181 905 5708.



Chris Hinsley, the inventor of *Taos*, coded some classic 8bit games





Rendered using *Real3D* on the Amiga, these test creatures are just part of the huge range of adversaries in *Spyfish*

SGI takeover

Alias Research and Wavefront Technologies, industry leaders in high-end graphics software, have been incorporated into the Silicon Graphics empire. The move will lead to a subsidiary company being formed within SGI to handle all software-related matters.

Silicon Graphics needed to consolidate its position following Microsoft's acquisition of SoftImage last year. Merging with these companies and integrating their software ensures that the status of SGI workstations as the powerhouses of videogame graphics is maintained.

SGI expects the entertainment industry to account for an increasingly large part of its income.

Spyfish tech specs

CPU:	Intel Pentium @ 133MHz (V2)
Co-processing:	Four fully populated PCI cards, each comprising: Motorola PowerPC 603 + 3Dlabs GLINT 300SX/300TX graphics accelerator
Graphics:	500,000 polygons/sec (V1); 1,200,000 polygons/sec with GLINT 300TX (V2) 50 frames per second 640x480 minimum resolution
Colour:	24bit (16,277,216 colours)
Memory:	EDRAM, VRAM 1Gb hard disk, CD-ROM drive 457Mb/sec bandwidth
Release:	Demonstration hardware (V1) available second quarter '95 Complete demonstration hardware (V2) available third quarter '95

Arcade giants do battle at **ATEI**

Edge attends Europe's premier amusement industry show



The ATEI was a chance for companies to consolidate their European position while they prepared for the next wave of games. UK VR outfit Virtuality (left). *Ace Driver* (right) is now gobbling money in the country's larger arcades

Where is it?

This is the home turf of one of Japan's most consistently successful software developers. The company's foundations were rocked (literally) in January this year when a severe natural disaster hit the area

The 51st Amusement Trade Exhibition International (ATEI) took place at Earls Court with all the flashing lights the coin-op industry could muster. Although ATEI covers everything coin-operated, over the past 25 years it has been the 'Skill With Prices' (SWP) units (basically, videogames) that have stolen the show, relegating the less glamorous 'Awards With Prices' (AWP) systems (essentially what we know as fruit machines) to the sidelines. And this year was no exception.

One of the most prominent stands at the show was Deith Leisure's. The largest British amusement machine distributor, Deith is owned by Sega Enterprises and its space was packed with the latest Sega products. Especially tempting were the two sixplayer *Daytona USA* units standing at either end of the stand. This was the latest version of the hit Model 2 game, incorporating the special 'Champion Cam' feature, whereby a video camera is trained on each player and the lead racer is displayed on a large screen. In Japanese and American venues, machines dispense certificates with a video still of the winning player. Judging by the four-deep queues, *Daytona*'s popularity is undiminished.

Also on Deith's stand was *Virtua Fighter 2*. Despite gossip that Sega was losing its edge to other manufacturers, the looks of amazement on the faces of delegates indicated that this polygon fighter will maintain its hold on the arcade beat 'em up sector.

Sega also had its own private booth at ATEI. Alongside *Virtua Cop* and *Virtua Fighter* was the AM3's second foray into the world of realtime 3D (Star Wars was the first), *Sega Rally*. Using a souped-up version of Sega's Model 2 CG board, *Sega Rally* also comes equipped with a mechanically assisted steering wheel providing realistic feedback from the 'road'.

The driving theme was continued with Namco's highly playable – albeit unremarkable – *Ace Driver*, found on the Brent Leisure stand. But Namco's crowning glory was the exquisitely designed *Cyber Commando*. This vastly improved sequel to its 1993 coin-op *Cybersled* includes some spectacular graphics (see page 48).

ATEI was in effect a microcosm of the amusement trade. The show was dominated by the videogames sector, which was in turn dominated by the two biggest players, Sega and Namco. This situation looks set to continue for the foreseeable future.



Mimicking the latest Japanese driving fad, *Sega Rally* offers powerslides galore



***Cyber Commando* (above) features classic gameplay with state-of-the-art visuals**

Develop! 95: looking to the future

If you're a games producer, you should be at Develop! 95

it is...
Kobe, Japan. The earthquake that hit the city early this year threatened Konami's HQ, but the building's advanced anti-earthquake system ensured that, instead of collapsing, it was merely reduced in height

Most videogames shows and conferences exist merely to give people the chance to get their hands on the latest software and hardware. Rarely are the creative forces, the logic and the targets behind the decisions made by the movers and shakers of the games industry exposed to general scrutiny.

Develop! 95 is different. This unique conference offers developers the chance to quiz the people who run the videogames industry, and gain a deeper understanding of the mechanics of game production, from conception to the marketing of the finished product.

Organised by BTP in conjunction with Blenheim and sponsored by the magazine you're holding now, Develop! offers an exclusive insight into the interactive entertainment industry. Taking place as part of Europe's biggest specialist trade exhibition, the Electronic Computer Trade Show, Develop! will attract many of the development community's most important players.

BLENHEIM

DEVELOP! 95

The aim of the conference is to provide information on the best way to approach the complex task of producing a videogame. Bank loans, copyright issues and how to attract subsidies are covered, as well as music scores, graphics and attractive character design. There won't be ready-made answers to your problems, but the range of professional advice on hand will at least mean that your decisions are informed ones.

Develop! 95 will be split into six two-hour sessions, spread over two days. This ensures that delegates won't be locked into the conference room and will have ample opportunity to sample the attractions of the ECTS proper. The chance to attend both events should provide visitors with a valuable mix of theory and reality.

Develop!, which is now in its fourth year, has now confirmed its list of seminars and speakers for 1995. The event is kicked off by 'Understand The Process', an overview of the practicalities of developing in today's competitive environment. Many software houses waste a significant amount of time fumbling with the most fundamental aspects of multimedia design, and particularly treacherous areas like file formats, budget →





Last year, Develop! played host to 3DO CEO Trip Hawkins (above), Julian Lynn-Evans from Philips (top, left) and TripMedia's David Collier (top, right)

Compaq beats Big Blue

Compaq is now officially the largest computer manufacturer in the world. Its PC sales rose by 53% last year to a total of 4.8 million units, which means that it crossed the all-important $10 billion sales barrier faster than any other firm in history – in under 12 years. Last year, Compaq's profits were £545 million.

Compaq now has 10% of the global computer market, with IBM and Apple joint second with 8.5% each, followed by Packard Bell with 4.9% and NEC with 4%.



Develop! takes place in conjunction with ECTS, which is moving from the Islington Business Design Centre (above) to the Grand Hall, Olympia

➔ schedules and deadlines for freelance programmers will all be covered.

This discussion of logistical problems is backed up by a seminar on efficient money management. 'The Mechanics Of Money' compares the organisation of films, music and theatre with games financing. Barclays Bank will be present to talk about exploiting opportunities and ideas.

But arguably the most useful session of Develop! 95 is 'Creation And Inspiration'. With an increasing number of games incorporating expensive pre-rendered visuals and sumptuous graphics, and the cost of professional equipment and software remaining high, this discussion of the need for accurate and thorough pre-production planning could well end up saving you money.

Develop! enables developers to gain a deeper understanding of the mechanics of game production, from conception to marketing

Yamaha gets into graphics

Yamaha and Criterion are collaborating to produce a low-cost VR graphics board for the PC. Yamaha's YGV611 Rendering Polygon Processor will be the power behind the polygons, with an optimised version of Criterion's *RenderWare 3D* API [see Edge 7] used as the software development tool.

Yamaha claims that the YGV611 generates 550,000 Gouraud-shaded polygons a second – 210,000 with texture mapping applied (32bit colour and z-buffering can be used with no performance penalty). The board is being targeted at the sub-$300 market, placing it in direct competition with 3Dlabs'/Creative's GLINT-based board.

On the second day of Develop!, 'The March Of Technology' takes delegates into the future. Five speakers from leading development companies, including Jaguar designer Martin Brennan, discuss specific technologies that could have important implications for future production strategies.

In the penultimate group, 'It's Not That Difficult', respected publishers, designers and producers explain how you can capitalise on all the new multimedia opportunities now waiting to be grasped, even if you have little experience in the field. Learning the necessary skills might not take as long as you think.

The final session gives you the opportunity to question prominent industry executives, including Nick Alexander (former head of Sega and now managing director of Pearson New Media), Michelle DeLorenzo (president of Viacom New Media), and David Pullen (head of interactive entertainment at BMG UK).

Develop! 95 takes place on Sunday 26 and Monday 27 March, 1995, from 10am to 5:30pm. All events will be held in the Pillar Hall of the Grand Hall, Olympia, London. Each session costs £45+VAT (£52.87 including VAT). For further details, including booking and enquiries, contact the organisers, BTP, on +44 (0)171 336 0066. **E**

This month on EDGE

Tasty titbits of news and gossip that helped make issue 19 an experience to savour

Just as issue 19 was closing, a Jaguar CD-ROM drive arrived for inspection in the **Edge** office. First impressions were encouraging: it may still owe a little too much to the Armitage Shanks school of design but its CinePak video playback is excellent – probably superior to any other console's bar the PlayStation's. The down side is that the CD drive lid has no soft-eject (a veritable crime), which results in an undignified rattle when you press the button. And, unfortunately, there were no games to play on it either. Still, Jeff Minter's Virtual Light Machine provides a typically... Jeff MInter experience under the right conditions.

Such is the demand for the PlayStation in the UK that it seems importers will do almost anything to get hold of stocks. This month **Edge** received a call from one desperate individual who had emigrated to Japan just to secure machines. Currently living about 30 miles outside Tokyo, his daily routine consists of touring the game shops and department stores voraciously accumulating PlayStations and – presumably to get round the 'one machine per customer' rule – claiming that he has lot of kids. No doubt the Sony police already have a price on his head.

Nintendo has named Manchester-based Software Creations as the latest addition to its Ultra 64 'Dream Team' of developers. The company's unmatched portfolio of game music (ex-employee Tim Follin created some of the most memorable soundtracks on the NES and SNES) has won it the licence to develop the sound tools for the Ultra 64.

Still with Nintendo, the big N has filed a lawsuit against electronics giant Samsung after finding specialist components made by the Korean company inside pirate copies of *Donkey Kong Country.* And Samsung is one of Nintendo's official suppliers...

Atari's US PR agency issued a hilarious press release this month. Sadly, it wasn't meant to be funny. Entitled 'Interactive Entertainment's Big Cat Captivates Consumers', it highlights the enthusiastic feedback Atari has received since the Jaguar's launch.

Typical responses include Allen Chang's 'From the esthetics [sic] of the console to the hardware, I love it!' One owner gets rather carried away: 'Thank you... Proud parent of a two pound baby Jaguar!!!!' Another confides that his mother had never liked videogames until she tried the Jaguar: 'Now she's getting top scores in *Crescent Galaxy*. Now she's having fun!!!' Surely not.

Tunes that helped **Edge** through its 19th nervous breakdown: **1** 'Modern Life Is Rubbish' (Blur); **2** 'Good News...' (Simple Minds) **3** 'Revenge Of The Goldfish' (Inspiral Carpets); **4** 'Unplugged' (Nirvana); **5** 'Schubert Dip' (EMF).

Datebook

March

PC Forum March 5–8, Phoenix, Arizona. Contact Daphne Kis on: **+1 212 924 8800**. Fax: **+1 212 924 0240**

CeBIT '95 March 8–15, Hanover, Germany. Tel: **+1 609 987 1202**. Fax: **+1 609 987 0092**

World Of Entertainment March 10–12, Prague, Czech Republic. Tel: **+422 2491 1681**

International Gaming Business Exposition March 20–22, Sands Exhibition Centre, Las Vegas. Tel Bill Norton: **+1 203 852 0500**

Spring Electronic Consumer Trade Show March 26–28, Olympia, London. Tel: **0181 742 2828**

May

Electronic Entertainment Expo (E³) May 11–13, Los Angeles Convention Center, Los Angeles, California. Tel: **+1 914 328 9157**

FER '95 May 10–12, Pabellon de Cristal, Patronato de la Feria del Campo, Madrid, Spain. Tel: **+34 3 415 0095**

China AM '95 May 20–26, Shanghai Trade Centre, China. Tel: **+86 21 5360118**

June

Asian Amusement Expo June 7–8, Hong Kong Amusement and Exhibition Centre, Wanchat, Hong Kong. Contact show organisers William T Glasgow, Inc, 16066 South Park Avenue, South Holland, IL 60473-1500. Tel: **+1 708 333 9292**. Fax: **+1 708 333 4086**

FER '95 June 8–9, CAAO Convention and Expo, The World Congress Centre, Melbourne, Australia. Tel: **+61 3 763 0698**

Taiwan Amusement Machine Exhibition June 22–28, Cetra Exhibition Hall, Taipei, Taiwan. Contact Taiwan Slot Machine, 2F, 17 Pao Ching Street, Taipei, Taiwan. Tel: **+886 2 746 6860**. Fax: **+886 2 746 6875**

Show organisers: if your show isn't listed here, it's only because you haven't told **Edge** about it. Send details to **Datebook, Edge, 30 Monmouth Street, Bath BA1 2BW.** Tel: 01225 442244. Fax: 01225 338236. E-mail: edge@futurenet.co.uk.

Subscribe to Edge

Do you buy **Edge** every month?
Then why not **subscribe?**



Is Edge worth subscribing to? The UK videogames industry thinks so – Edge was voted its Magazine Of The Year

and enjoy **free delivery** to your home in the **UK**

The price you pay **now** is **fixed** for the duration of your subscription

You are **guaranteed** to get every issue – you'll never miss **essential information**

Our **no-risk** guarantee means you can always cancel later with no penalty

How to **subscribe**

1 **Complete** and **return** the coupon on the enclosed card or telephone 01225 822511

2 To pay by **direct debit**, complete and return the coupon on the card **plus** the direct debit coupon below

3 Return your order to **Edge Subscriptions, FREEPOST (BS4900), Somerton, Somerset TA11 6BR**

EDGE direct debit form Originator's ID: 930763

To pay by direct debit, fill in this form and the subscription order form above and send both forms to the above address. The direct debit option is only available to subscribers with a UK-based sterling bank account. Direct debit payments are deducted annually in advance.



This form instructs your bank or building society to make payments direct from your account. Please complete all five items and send it to us as directed.

(Banks and building societies may refuse to accept instructions to pay direct debits from some types of accounts.)

1. Full address of your branch

To: The manager

....

.... Bank/building society

....

....

2. Account number: ☐☐☐☐☐☐☐☐

3. Sort code: ☐☐ ☐☐ ☐☐

4. Account in name of:

____

Instructions to bank/building society:

I instruct you to pay direct debits from my account at the request of Future Publishing Ltd
The amounts are variable and may be debited on various dates
I understand that Future Publishing Ltd may change the amounts and dates only after giving me prior notice
I will inform you in writing if I wish to cancel this instruction
I understand that if any direct debit is paid which breaks the terms of this instruction, you will make a refund

5. Signed ______________________________

Date ______________________________

Subscriptions HOTLINE: **01225 822511** (between 8:45am and 6pm)



Make a mark a

Since its inception in 1992, the Develop! conference has grown in stature to become the premier European event for multimedia producers and entertainment software developers.

Now, with the current boom in sales of CD-ROM-equipped computers and the imminent arrival of the next generation of 'super consoles', this year's conference will be an essential diary date for anyone involved in the production of entertainment software.

Develop! brings together under one roof the most visionary and influential speakers from the word of entertainment software development.

Develop! 95 will consist of six individual sessions covering topics as varied as software production, finance, content, new technology and the future. The final session is designed to appeal specifically to newcomers to the market and is therefore vital for those who have yet to take their first steps into the fast-moving world of entertainment software production.

The two day Develop! 95 conference takes place during ECTS Spring 95 (March 26th-28th) at the Grand Hall, Olympia, London. Develop! 95 is sponsored by Edge, Europe's leading interactive entertainment magazine.

INFORMATION

For bookings, general enquiries or information about Develop! please call BTP on + 44 (0)171 336 0066

BOOKING FORM
Photocopy/fax acceptable

To reserve delegate places please complete and return in an envelope with your cheque to the following address.
BTP Ltd., 18-20, St. John Street, London. EC1M 4AY
Please make cheques payable to BTP Ltd.

SESSION please tick as applicable

SUNDAY MARCH 26

- ☐ **1. Understand the process**
  10.00-1200 £45.00 + vat = £52.87
- ☐ **2. The mechanics of money**
  13.00-15.00 £45.00 + vat = £52.87
- ☐ **3. Creation and inspiration**
  15.30.-17.30 £45.00 + vat = £52.87

MONDAY MARCH 27

- ☐ **4. The march of technology**
  10.00-12.00 £45.00 + vat = £52.87
- ☐ **5. It's not that diffucult**
  13.00-15.00 £45.00 + vat = £52.87
- ☐ **6. Breaking the crystal ball**
  15.30-17.30 £45.00 + vat = £52.87
- ☐ 7. One day pass £125.00 +vat = £146.87
- ☐ 8. Two day pass £245 00 +vat = £287.87

TOTAL ______________________

Delegates Name ______________________

Job Title ______________________

Company ______________________

Address ______________________

____

____

____

Phone No. ______________________

Fax No. ______________________

All delegates will receive a free copy of Edge
Develop! takes place on March 26 27
at ECTS, Grand Hall, Olympia. London.



Sponsored by



at Develop! 95



TIMETABLE

SUNDAY MARCH 26

10.00-12.00
Session 1
UNDERSTAND THE PROCESS

Entertainment software development demands a whole range of skills, ranging from music composition to graphic design. Most developers understand something of the procedures involved in the various areas of media production, but many still experience practical difficulties when tackling them for the first time. In this nuts-and-bolts session, covering issues from payment levels and terms to file formats, the experts give you the tips you need to avoid disaster.

Key frames
John Lakewood, Future Reality
Music composition and production
Dave Da Costa, Interactive Music Services
Local Talent
Dave Malone, Graphic Colour Works
Don't Shoot the Video Producer!
Jim Reid, Independent
Aesthetic Interaction
Mike Williams, Neville Brody Studios

13.00-15.00
Session 2
THE MECHANICS OF MONEY

Film, music and theatre have long-established models for dealing with production finance, risk management, tax management and the sale of assets. At present, many publishers and developers operate comparatively unsophisticated financial models, but there are many systems for reducing the cost of cash, for raising additional production or corporate finance, or even for qualifying for subsidies from government organisations. This session is a unique opportunity to investigate the options available.

Understanding Money
Will Keen, Independent
Floating your business
Geoffrey Chamberlain and Peter Tabizel, Durlacher & Co
Applying for subsidies
Garth Shephard, tecKnowledge
Managing Bank Debt
Barclays Bank (speaker to be announced)
Venture Capital
John Scaife, Charon Capital Corporation

15.30-17.30
Session 3
CREATION AND INSPIRATION

The games industry has thrived on a combination of good ideas and ground-breaking technology. Escalating budgets and higher consumer expectations have placed more importance on the pre-production design phase. But the chaos of creativity does not always sit well with the disciplines of technology. In this session, four leading creative talents debate their art and its implications for interactive entertainment. Finally, the session will examine the essential issue of intellectual property protection.

The Conflict Between Plot and Interaction
Chris Crawford, Chris Crawford Games
The Essence of an Idea
Steve Cooke, Myelin
Music for Interaction
Nik and Mrs Fiend, Alien Sex Fiend
Create a living character
Dave Gibbons, Independent
Protect your property
Richard Taylor, The Simkins Partnership

MONDAY MARCH 27

10.00-12.00
Session 4
THE MARCH OF TECHNOLOGY

Entertainment industries have always acknowledged the power of high production values, whether you're designing Starlight Express, shooting Jurassic Park, or rendering high-resolution graphics for Myst. For the most part, however, other industries are working with well-established technologies; in the computer business, the goal-posts are shifting every day. This session illuminates the potentials and pitfalls of five specific technologies that could have important implications for your future production strategies.

Moving Images
Terry Bradshaw, Sigma Designs
Sound Tactics
David Fleck, Creative Labs
The Power of the Processor
Martin Brennan, Flare
In an unreal world
Foo Katan, BITS
Interactive Broadcasting
Matthew Tims, Two Way TV

13.00-15.00
Session 5
IT'S NOT THAT DIFFICULT!

The interactive entertainment industry continues to grow at an explosive rate. For those with the ideas, the commitment, and the desire there is a real opportunity to create successful properties in this exciting market. But it's never easy to enter a new market, even if you have parallel experience in another industry (film, for example, or design).

This session will give you everything you need to know in order to twist the nuts and bolts of the games industry, with help and advice from speakers with years of experience. The format of the session will be designed to maximise the opportunities for personal contact and interaction with the panellists, each of whom brings years of experience in their particular role.

Each speaker will outline their responsibilities, the processes they are a part of, and the industry partners they do business with. Introduced by popular demand, this essential session is designed especially for people outside the interactive entertainment industry, but who may have ideas, projects, or properties that they believe could be realised within it.

My Life As A Publisher
Tom Watson, Warner Interactive Entertainment
My Life As A Developer
Kevin Bulmer, DCD
My Life As A Producer
Neil Jackson, Argonaut
My Life As A Distributor
Robert Stallibrass, Active Distribution
My Life As A Marketing Director
Dean Barrett, Bastion
How to Publish It Yourself!
Andrew Waterhouse, PDQ

15.30-17.30
Session 6
BREAKING THE CRYSTAL BALL

This is a unique chance to meet and share the vision of leading executives from different industries as they disclose their personal agenda for the future of entertainment. This session is essential for anyone in the business of developing business strategies in this market, and will give you the opportunity not only to hear the plans of some of the most important companies, but also to question their representatives in a no-holds-barred environment. Additional speakers for this session will be announced separately.

Nick Alexander, CEO, Pearson New Entertainment
Michelle DeLorenzo, President, Viacom New Media
Keith Ferrell, Vice-President and Editor, Omni Magazine
David Pullen, Head of Interactive Entertainment, BMG UK
Mike Thorne, Director, New Music Media Development, Warner Music International



Express yourself in **Edge**. Write to: **Edge** letters, 30 Monmouth Street, Bath, Avon BA1 2BW

Having read the latest issues of **Edge** regarding the PlayStation and Saturn, I cannot understand how **Edge** is of the opinion that the Saturn is not as powerful as the Sony machine. How can you justify this claim? You have said that the PlayStation can render more polygons per second than the Saturn. Fair enough: in this department it's obvious that the victor is the PlayStation, but what about the sound and sprite manipulation capabilities? Do they not count for something? It has been said in your magazine that the Saturn is in a 'league of its own' when used for conventional 2D games. Its Yamaha sound hardware is said to be 'phenomenal', 'much better than the Sony's'. So how can you claim that Sega's machine is inferior to the PlayStation? In many ways it seems that Sega, not Sony, is leading the way in terms of hardware excellence. Perhaps it is time to reappraise both machines and not merely be swept off your feet by a good-looking guy clad from head to toe in polygons.

Kevin Hoque, Edinburgh

It's all a question of balance. The Saturn is equipped with independent chips for handling scrolling and sprites, but the extra 2D power they deliver is unlikely to be that visible unless Sega has a horde of power-hungry 2D games in the works. However, while the PlayStation is an exceptional 3D workhorse, it also packs enough 2D power to emulate the latest 2D coin-op beat 'em ups and shoot 'em ups with ease. Basically, both machines are capable of delivering great 2D graphics, but it is incredibly naive to play down the importance of 3D. The potential for original 2D gameplay has been diminishing for years – one look at *Clockwork Knight* on the Saturn shows how jaded game designers' ideas have become when dealing with two dimensions. 3D game design might be in its infancy, but it's the future of the industry.

On the issue of sound, while the Saturn's Yamaha board has a better spec, it's unlikely to shine through simply because sound quality in games has levelled off more quickly than graphics performance – most developers prefer to use Red Book CD music (as in *Ridge Racer* and *Virtua Fighter*) and, besides, it would take a very talented and patient musician to push the Saturn far enough so you'd notice the superior spec. The bottom line is that Sega has maximised those facets of its machine that seem to matter least in gameplay terms. A skilfully coded *Daytona USA* would keep Sony on its toes, though…



Clockwork Knight (left) failed to inspire confidence in the Saturn. Will *Daytona* do the trick? (See Kevin Hoque's letter)

I write to you in complete disbelief, disgust and disillusion. What am I referring to? The unbelievable bias towards the Sony PlayStation and the hypocrisy in recent reviews. I would like to start by saying that different people have different tastes. Machines like the PlayStation, Saturn, 3DO, Jaguar and CD³² are all there to give people a choice according to what suits their pockets and their needs, but your recent 'brainwashing' is limiting people's choice. Let me tell you that this is not sour grapes from a 3DO owner – I am delighted with my 3DO – but I would like to know why you made the following comments in your magazine.

Firstly, in **Edge** 17 you compared the 3DO sales with those of the 16bit consoles, saying that there is one 3DO in the UK for every 400 SNESs or Mega Drives. 16bit consoles have had five years to establish themselves, while the 3DO has had just four months. Also, why was there no mention of the fact that *Super SFIIX* is number one in the all-formats charts in Japan? Could it be because the format was 3DO? And why, in **Edge** 16, did you tell people that the road

movement in *The Need For Speed* was 'remarkable' and then in **Edge** 17 (after a quick burst of *Ridge Racer* on the PlayStation) compare *The Need For Speed* with *Test Drive* on the Amiga, saying or implying that *TNFS* has a chugging frame rate and a road only plotted a few feet in front of the car? And don't tell me that you were referring to the view from inside the car because you can still see way into the horizon (except when travelling uphill). To add insult to embarrassment, you inform people about the glitches in *Ridge Racer* – things like a lower resolution than the coin-op, a loss of finer detail and screen slowdown – and then call it a 'nigh faultless conversion'. And to call *Ridge Racer* a simulation is laughable, given that *The Need For Speed* has three real environments, eight real cars and proper crashes, etc. Having seen both games and owning *The Need For Speed*, I know they are both outstanding titles and deserve great applause but God knows how the programmers of *TNFS* felt after reading your bias towards one particular format in the *Ridge Racer* review.

One last point: why fill the pages of **Edge** with PlayStation and Saturn reviews extending to as much as five pages when the machine isn't even available yet? Everyone knows it's unwise to buy on import, so few of your readers own one of these machines compared to the ones that are already here. Instead of this brainwashing, why not give people sound, realistic advice. I think I speak for all owners of next-generation consoles when I say: Come on, **Edge**, give us all a break and allow for a bit of competition. One dominant machine would ruin the future of videogaming.

Ian McKenzie
Scotland

Edge's comment about the 3DO's userbase was a reflection of the amount of attention the format has commanded in the market since its US launch back in October '93. It wasn't meant to be a fair comparison, based on time in the market. 3DO forms a minuscule part of the mainstream videogames industry and yet the format receives large amounts of coverage, not least in **Edge**. As for *Super SFIIX*, **Edge** canned its charts coverage several months ago, which is the most likely reason for its success in Japan going unreported.

Regarding *Ridge Racer* vs *The Need For Speed* (or is this really a PlayStation vs 3DO issue?), if you put the two games side by side, *TNFS* does have a chugging frame rate. It's acceptable, even impressive by current standards (hence the praise in the review), but it's slower than *Ridge Racer* and the in-car view doesn't come close to its *Ridge Racer* equivalent. The simulation aspect of *Ridge Racer* – that is, the feeling of being inside a car with thoroughly realistic handling – is something that only becomes clear after several plays. *TNFS* is a good example of what the 3DO's technology can do, but as a challenging game it isn't a patch on *Ridge Racer*, hence the lower score. And only the most pedantic would say that *Ridge Racer*'s minor deficiencies detract from its success as a conversion. The programming team only had six months to transfer it onto a new platform so we'll forgive them their few small failings. It's an astonishing achievement.

After reporting on the PlayStation for the last year, is **Edge** really expected to delay the review for ten months until the UK launch? Just because the machine isn't widely available doesn't mean people don't want to read about it. Does everyone who buys Car magazine or Top Gear own the latest Porsche or Ferrari? And those 'unwise' enough to have used the import market over the last six years to buy machines such as the PC Engine and Super Famicom long before their arrival in the UK (one of them never actually made it) will be bemused by your attitude. Sour grapes? Wake up and smell that bottle of mouldy old Liebfraumilch you've just uncorked…



Ridge Racer (left) vs *The Need For Speed*: Ian McKenzie accused Edge of allowing PlayStation fever to impair its judgement and of brainwashing its readers

May I first congratulate you on your magazine. Its neutral viewpoints are a breath of fresh air to avid technobods like myself.

I've read probably a good 90% of your articles on the PlayStation but not a lot of the information covers the marketing of the machine and decisions about how and where the products will be sold. Having been in electronic retail for nine-and-a-half years selling photographic, computer and video equipment, I've found that the bigger the company the worse its marketing and technical support becomes. Trying to get Sony or Panasonic to answer a small question on the phone or even find a part or product number (of something you know is available) is either impossible or they keep you on the phone for ages and/or tell you that you need another phone number. You then get re-routed so much that you give up. Remember, I'm a dealer trying to obtain information for the customer, so what hope has the customer himself got?

I can't knock the products themselves or the prices generally, but why can't we get some decent service from these companies that spar for world domination and our money?

Colin Hodges,
London



Colin Hodges thinks that large electronics manufacturers are letting retailers down

True, large corporations are rarely renowned for friendly, responsive service, but if Sony wants to make money from the PlayStation in the UK it must also assume the responsibilities that selling a videogames console entails. As Sony's first games machine, the PlayStation is perhaps in more danger of mishandling than other Sony products, so maybe the company will improve the accessibility of its after-sales and technical support.

Continued next page

viewpoint

Hmm… Where do I start? 'I read Noel Wallace's letter in **Edge** 16 and had to laugh?' Nah. I could be pedantic and point out that programming in *C* – or *BASIC* or *Pascal* for that matter – doesn't reduce the actual MIPS of a processor at all. Maybe that's too techy. I know! I could actually reproduce the second and third paragraphs of his letter, swapping around the words 'C' and 'assembler' and hopefully start a futile but long-running war similar to the infamous Spectrum vs C64 or ST vs Amiga battles of the 1980s.

I guess I'll just reiterate the fact that I've got nothing against assembler or those who write games using it, add that Jon Ritman's comment that using *C* reduced a machine to 20-40% of its potential speed was silly but Noel saying it went down to 10% defies belief, and think myself lucky that I didn't mention *C++*.

Matthew Pass, Surbiton

Here are some basic FACTS about the differences between programming in pure assembly language and *C*.

Fact 1: painstakingly coded assembly language is almost always faster than the equivalent *C* program.

Fact 2: anything that can be programmed in *C* can be programmed in assembly.

Fact 3: championing the use of pure assembly language earns you loads of street cred from trainspotter types who then write to **Edge** to show how well informed they are.

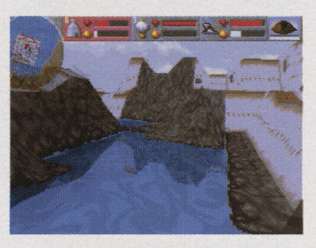
Fact 4: Assembly isn't worth the hassle.

It is possible that if you dug out an eight-year-old Amiga *C* compiler and started writing *C* as if it were *BASIC* your code could be 10 times slower than hand-coded assembler, but a modern optimising *C* compiler such as *Watcom10* (the nearest thing to an industry standard on the PC) produces code that is at worst 50% slower than the equivalent assembly code and at best slightly faster! Jon Ritman, Noel Wallace and the anoraks are probably jumping up and down shouting, 'Bollocks', but here's why.

Decent compilers can speed up code by using tricks like 'pipelining' (allowing certain instructions to execute simultaneously by placing them in strange unreadable orders), load-store models (simple instructions work faster, making the code larger but faster and harder to follow) and code alignment (re-ordering instructions so the processor can read them faster). Admittedly, an assembly coder could handle these considerations while simultaneously remembering which variable is in which register, and solve any programming problem and maybe only take about four times longer than a *C* programmer, but the real problem is that the assembler zealot would probably be coding up the first algorithm he could think of, while a *C* programmer could be using his brain to think of more elegant, faster and/or smaller solutions. Then there's the debugging. The assembly will be at least twice the size of the *C* (this is where Noel Wallace's ignorance really shows) and immeasurably less readable.

Don't assume that I don't know what I'm talking about. I wrote the engines for three pure assembler games – *Populous*, *Powermonger* and *Populous II* – and convincing myself that assembler is not worth the hassle has been a long process. *Magic Carpet* is entirely written in *C* except for my polygon routine and about 200 lines of other graphics code which are highly optimised assembler. While the game is running it spends 96% of its time in these routines. If Bullfrog decided to convert the 70,000+ lines of *C* code to 140,000+ lines of assembly for the sake of a 20-30% speed increase on the remaining 4% of the runtime, the best we could hope for would be a 1% overall speed increase, a couple of debugging suicides and a 1999 release date!

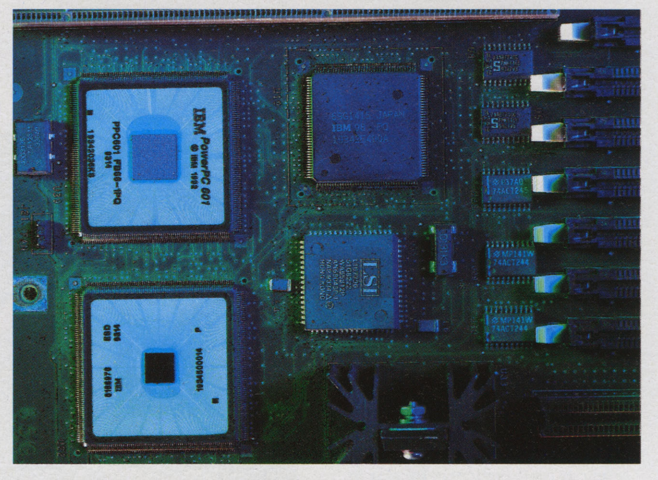
Glenn Corpes, Head of R&D, Bullfrog



***Magic Carpet* programmer Glen Corpes joins the *C* versus assembler 'debate'**

I have been buying **Edge** religiously for some time and have recently started noticing your references in the letters pages to Acorn's RISC PC. In **Edge** 17 Paul Biggs from Derby wrote asking whether you can add extra processors to the RISC PC, such as Power Mac, to which you answered a resounding 'no'. The truth of the matter is, of course, yes, you can add extra processors to your machine. Acorn has just announced a partnership with Blue Micro (IBM's UK manufacturers) enabling it to manufacture the 486 card for the RISC PC. The card allows you to have a 486DX/33 or 486DX2/66 running in a window on your *RISC OS 3.5* desktop without the need for any emulation. Simtec is not the only supplier; Aleph One (01223 811679) has a card too and also sells a PC card without a processor so you can add your own. At this stage, of course, the avid Acorn-junkie would do his 'you really must check your facts, no wonder the Arc's got a small user base, blah blah' routine, but you do have a lot to deal with and can't check everything. It's up to us to let you know.

James Coates



James Coates corrects Edge's assertion in issue 17 that RISC PC owners can't add extra processors to their machines

Thanks for the correction. Now all **Edge** needs is a RISC PC…



I own an NEC 3XI multispin triple-speed CD-ROM drive, something I am very proud of. Although I am a dedicated PC owner, I was very pleased when news reached me of the forthcoming 3DO card. This would enable me to play some seriously good 'killer apps' on the PC and, at only £250, it's good value. However, to my dismay, those bastards at Creative Labs, the inventors of the 3DO card, have made it impossible to use the card without a crappy, substandard Creative Labs CD-ROM drive. Bollocks to that. What a cop-out!

On the subject of crap, what an anti-climax *Rise Of The Robots* turned out to be. Massive media hype and PR exercises, brilliant raytraced graphics and artificial intelligence, and for what? It's the exact opposite of what games are all about. What a waste of so much potential.

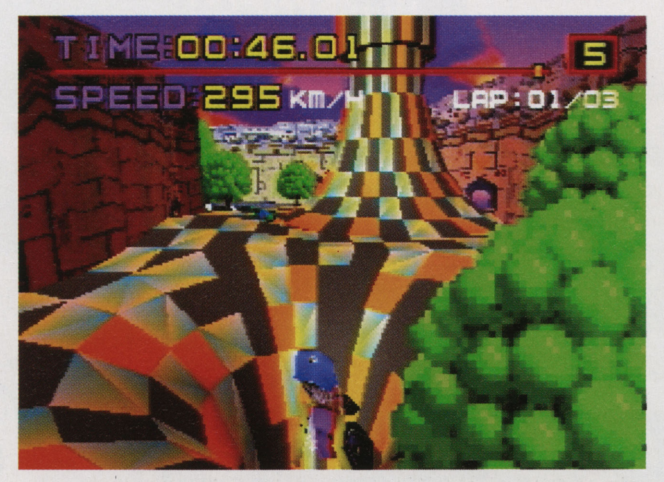
I would like to ask why the PC is neglected as far as console/arcade-type games are concerned. As far as I can see, there should be no problems with power; most new PCs sold are 486 at 66MHz, some reaching 100MHz with Pentium chips and now the new 586. SVGA monitors can display millions of colours and 64bit graphics cards provide amazing performance with enough VRAM. Things are improving, though, with more companies realising the PC's potential for action-oriented games. For too long the PC has been dedicated to adventures and RPGs. This is all very well but there's not

enough choice. When will *Super Street Fighter II* and *Mortal Kombat II* be released on the PC? What about more direct arcade conversions such as *Daytona*?

Edge is simply brilliant, but what happened to the charts page last issue?

Angus Hutchison-Brown, Norwich

More action games will be arriving on the PC in the future, but in the past the machine has been thwarted in this respect by a lack of control standards – playing a state-of-the-art raytraced beat 'em up with a couple of cursor keys and the space bar is not a particularly desirable situation. But things are looking up. Namco has *Ridge Racer* and other coin-op conversions on their way to the PC, and Sony's PC-orientated development strategy for the PlayStation means that many games that get developed for the console will also be given a PC release.



Richard Melville is 'greatly worried' about Edge's use of the word 'bizarre' to describe *Motor Toon GP*

I am greatly worried about your use of the word 'bizarre'. This word seems to be slapped on to every Japanese game that you review or preview. *Parodius* is an exception. Konami did not make the game stand out on purpose. When you call new games like SCE's *Motor Toon GP* 'bizarre' just because the cars mutate into living characters, I find it quite strange. You call Japanese culture weird when it is in fact just their normal culture. The Japanese have Endurance (the game show), *Super Puyo Puyo* and *Parodius*. We have The Generation Game, *Wizball* and a billion Amiga RPGs. I think when you say bizarre you mean 'original'. Your magazine is otherwise great but how about making it available every two weeks please?

Richard Melville, M16 fanzine, Exeter

Hmm, not quite sure what you're getting at here. **Edge** feels just as comfortable handling imported Japanese games as it does western games. However, when set against western cultural norms, much of Japanese popular culture could indeed be described as 'bizarre'. **Edge**'s use of the word wasn't mean to imply that *Motor Toon GP* was bad, but compared to most western software it certainly is a little weird – which, it must be stressed, is no bad thing. In fact, if only more console games were a little more 'bizarre'.



James Hinchcliffe isn't entirely satisfied with his PC's handling of *Wing Commander III*

After much enthusiasm about the 3DO, I have recently decided to invest in a safer platform (although I do still feel that the 3DO will succeed). The platform I am talking about is the PC CD-ROM. A 486DX2/66 with 8Mb RAM, 256K cache, double-speed CD-ROM drive, etc. I am sure you will agree that this sounds like a good, solid machine capable of running all games programs without any trouble. That was what I was told.

However, this is not the case. Sure, it runs *Doom II* and *FIFA Soccer* perfectly. It's when I get into the spec-hungry blockbusters like *US Navy Fighters* and *Wing Commander III* that I seem to have trouble. In both cases I have the required spec and often more. I was especially disappointed with *WCIII*. The gameplay, graphics, sound and FMV were all virtually faultless but I found myself having to wait several minutes just to fly a single mission. When I was flying an important dogfight in the outer reaches of space and about to blow a Kilrathi spaceship into a thousand pieces, the hard drive had to load so that my wingman could talk to me, thus stopping the game in mid-flight. The tension that had been building up just drifted away.

I have been told there is nothing wrong with my machine by a friend who has been experiencing the same problems. I feel slightly cheated. When you spend £45 on a game that has allegedly cost $4m you expect it to be faultless. There is an easy solution to this problem. As it trumpets on the literature, 'Buy a Pentium.' I have the feeling that you would need a 90MHz Pentium chip with 16Mb RAM to make the game run to its full potential. An avenue that is blocked by the price tag. It is about time that games companies reviewed their strategy somewhat. I do not see the point of releasing a game that requires the 'next generation' of PC CD-ROM specs now. Many people will fall into the trap and buy a game that their computer can just about handle but not very well. Eventually, patience will wear thin and these games will not be bought by the public. Then perhaps programmers will finally get the message.

James Hinchcliffe, Bristol

The answer lies to a certain extent in a program called smartdrv.exe, or Smartdrive. This is a disk caching program supplied with DOS that uses part of your computer's RAM to store frequently needed data (from either the hard disk or the CD-ROM). Obviously, accessing data from RAM (taking 70ns) is faster than waiting for the CD-ROM (which would take about 300ks). Unfortunately, *WCIII* requires as much RAM as possible for normal game functions and so objects to any RAM being used by Smartdrive. The result is that the CD-ROM itself must be accessed every time data is required. The large (20Mb) swap file alleviates this problem to a degree but the only other solution is, as you say, a 'next generation' machine or a nearby kettle with which to occupy yourself while missions load.

I was wondering if you people had any tips regarding the getting of a games programmer's job which I can do from my home. The point is, I live in the Netherlands and there is nothing game related there as far as I can see. The interesting companies are in Japan, the States and the UK. What would be the best way to get the necessary contacts? In comparison, of all the jobs that are in the back of the **Edge** magazine, I easily qualify for virtually all programmers' jobs. Yet I prefer to do the programming from my own home town and simply travel up and down to London a dozen of times a year. Among that I would love to program for the newer machines. Apparently you need to be a company with some name before Sega allows you to become a developer. I would make programming games a living if I could. What useful tips do you have?

Mike Dijkema, Groningen, The Netherlands

A good starting point would be to actually get in touch with potential employers – like the ones who advertise in **Edge** – and ask them what the chances are of obtaining home-based work. However, the videogames industry has become increasingly corporate over the past few years, with vast sums of money poured into ever more ambitious projects, and lone programmers are now becoming an extremely rare breed.



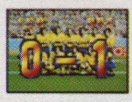
Latest titles and Great works...
It's the NEO GEO Universe.

SOFTWARES: Coming Soon!

1 *King of the monsters*
2 *Sengoku 2*
3 *Ghost Pilots*

 1  2  3

4 *3 Count Bout*
5 *Soccer Brawl*
6 *Super Sidekicks*

 4  5  6

7 *World Heroes*
8 *Baseball Stars Professional*
9 *Cyber Lip*

 7  8  9

10 *Robo Army*
11 *World Heroes 2*
12 *Double Dragon*

 10  11  12

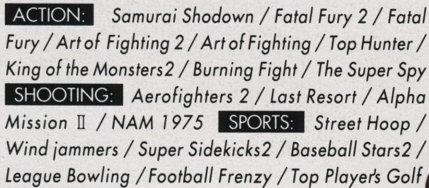
13 *Galaxy Fight*
14 *Riding Hero*
15 *Super Sidekicks 3*

 13  14  15

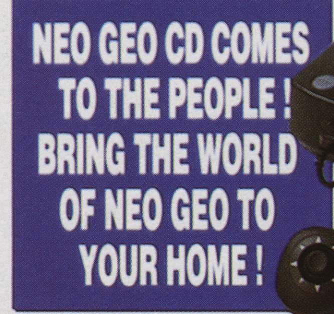
SOFTWARES: Now Available!

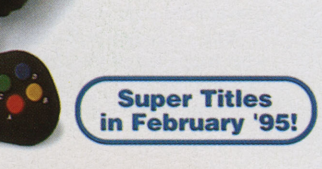
16 *Samurai Shodown II*
17 *The King of Fighters '94*
18 *Fatal Fury Special*

  16  17 18



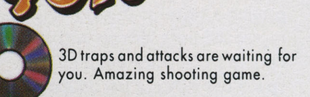
ACTION: Samurai Shodown / Fatal Fury 2 / Fatal Fury / Art of Fighting 2 / Art of Fighting / Top Hunter / King of the Monsters2 / Burning Fight / The Super Spy **SHOOTING:** Aerofighters 2 / Last Resort / Alpha Mission II / NAM 1975 **SPORTS:** Street Hoop / Wind jammers / Super Sidekicks2 / Baseball Stars2 / League Bowling / Football Frenzy / Top Player's Golf **PUZZLE:** Puzzled



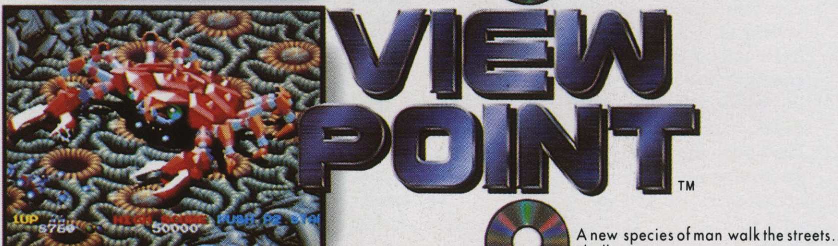


Super Titles in February '95!





3D traps and attacks are waiting for you. Amazing shooting game.



A new species of man walk the streets.. Thrilling action game.



A game faster than a heart beat. Futuristic robotic baseball game.

And Many Many More...



Fighting Action	FATAL FURY 3
Fighting Action	SAVAGE REIGN



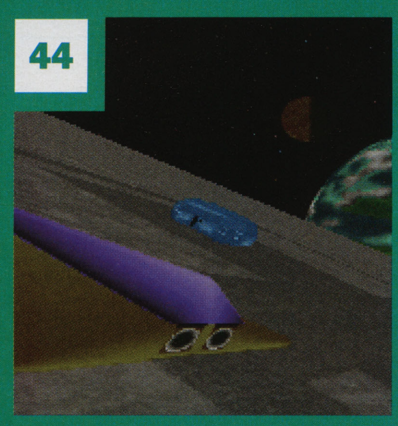




SNK CORPORATION SNK BLDG., 18-12 TOYOTSU-CHO, SUITA-SHI, OSAKA, 564, JAPAN. TELEPHONE:(81)6-339-5577 FAX:(81)6-338-7175
SNK CORPORATION OF AMERICA 20603 EARL STREET, TORRANCE, CA90503,U.S.A. TELEPHONE:(1)310-371-7100 FAX:(1)-310-371-0969
SNK ASIA LIMITED SUITE 807, TOWER 1, THE GATEWAY, 25 CANTON ROAD, TSIM SHA TSUI, KOWLOON, HONG KONG. TELEPHONE:(852)2-730-0420 FAX :(852)2-375-3203
SNK EUROPE LIMITED 11 ALBEMARLE STREET, LONDON WIX 3HE, ENGLAND. TELEPHONE:(44)71-629-0472 FAX :(44)71-629-0474

Prescreen

44



39



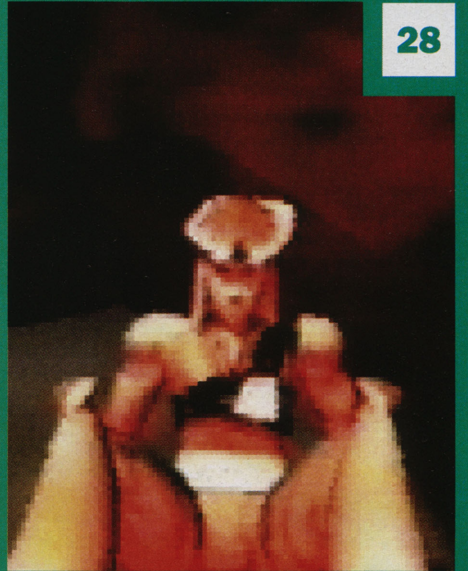
41



42



28



32



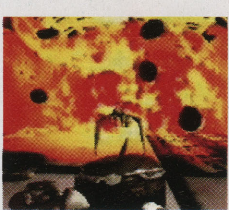
48



Panzer Dragoon

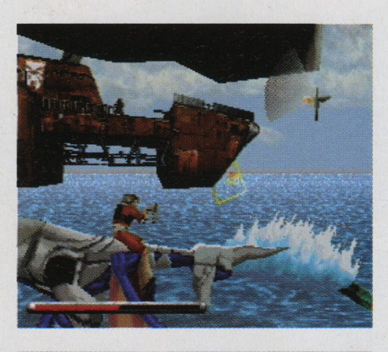


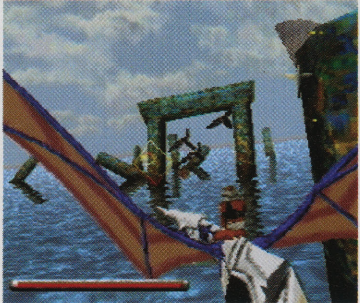






The five-minute intro sequence sets the tone of the game perfectly. It follows the game's hero as he happens upon a dragon, an ancient war machine. He's soon off on the ride of his life...





The first boss launches torpedoes (top). A typical wave of early nasties (above)

Sega's 3D blaster for the Saturn contains neither panzers nor dragoons, but it does offer a sumptuous visual feast for shoot 'em up fans

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**Andromeda**
Release date:	**March (Japan)**
Origin:	**Japan**

It's clear that from the outset Sega intended *Panzer Dragoon* to be something distinct from the standard Japanese fare of racers, beat 'em ups and RPGs.

Sega Europe has recently been demoing the beautiful-looking game to selected representatives of the videogames press. Although the convoluted scenario brings to mind cheap swords 'n' sorcery-style paperback novels, it does provide the game with most of its structure so is worth outlining.

Panzer Dragoon is set on a distant planet where humans are in danger of extinction. It has been a thousand years since civilisation was at its peak and people now live in small, isolated villages. The ruins of the ancient civilisation – the 'relics of the ancients' – hold the key to human survival, but they're guarded by still-active war machines and strange animals known as 'living attackers'.

War rages on the planet as a ruthless imperial power attempts to take control through the technology of the ancients. The Empire has already learned how to activate mysterious towers and awaken the dragons that sleep inside them.

You play a character called Kaeru Furyuge, a 16-year-old hunter who happens to be in a tower when a dragon awakes. After successfully making contact with the mysterious creature, he sets off around the planet



Sega's inhouse developer, Team Andromeda, has incorporated terrific (although not wholly realistic) water effects into the first level









The grand-looking temple (top) appears towards the end of the first level. Its interior is much less plush (above)



As the game kicks off, your steed banks dramatically away from the camera (top). Alien lifeforms come in many strange varieties (above)

From this strange broth Sega has distilled a spectacular 3D shoot 'em up with one of the most spectacular sensations of flight yet seen in a videogame

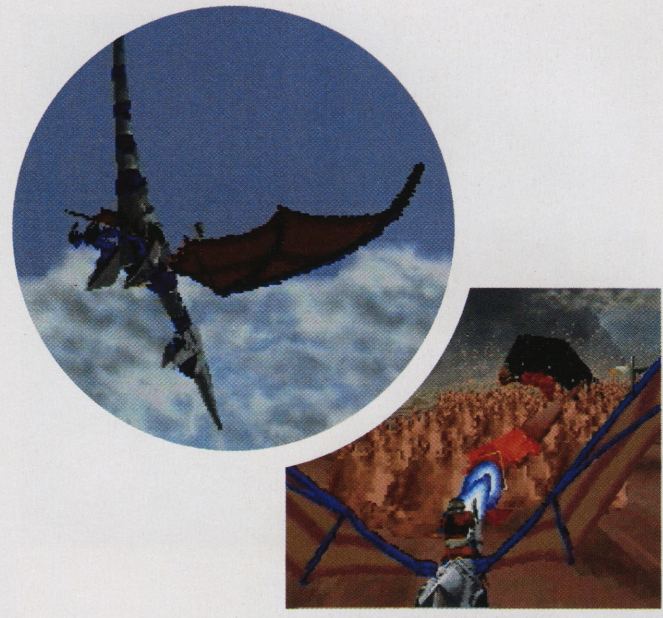
astride the beast with the intention of taking on the Empire.

From this strange broth Sega has distilled a spectacular 3D shoot 'em up with one of the most convincing sensations of flight yet seen in a videogame. However, the gameplay is not all it appears from these screenshots: instead of having complete control of the dragon, you fly through the level environments 'on rails'. In effect, you play the dragon's 'gunner', protecting it from harm by downing the enemies that attack from all sides – it's the dragon that has an energy bar, not your character.

The game feels like a curious hybrid of *Magic Carpet*, *Starfox* and Sega's own *Space Harrier*. The graphics regularly evoke recollections of Bullfrog's finest hour, with fantastical texture-mapped landscapes that undulate beneath you and all manner of strange foes both on land and in your own airspace.

Panzer Dragoon's similarity to *Space Harrier* derives from the fact that both games are simple 3D into-the-screen shoot 'em ups; irrespective of graphical flair, both are essentially very straightforward to play. Although *Panzer* features a weapon sighting system, nigh-continuous button bashing is required to make significant progress. Your character's weapon, a futuristic laser crossbow affair, can also be powered up, *R-Type* style, whereupon its sight

Continued next page

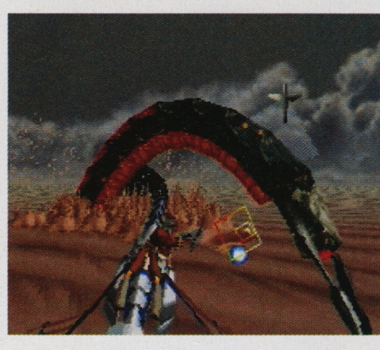


changes to a square, allowing you to unleash a searing blue bolt.

Finally, the level structure is engineered in a similar fashion to Argonaut/Nintendo's renowned joint venture. Your escapade alternates between overground sections and subterranean segments comprising tunnels and caves, with each of the five levels rounded off with a boss character. The fact that everything is 'on rails' allows for effective set pieces and ensures that the Saturn maintains a brisk speed while hammering out an optimum number of onscreen details.

Panzer Dragoon takes Sega's multiple gameview principle to new heights, allowing you to survey your surroundings through 360° from the back of your mount. The shoulder buttons of the Saturn pad twist the view through the four points of the





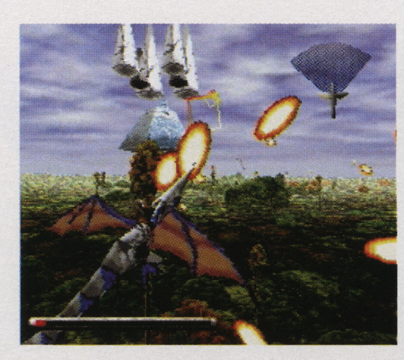
The sandy environment of level two is home to gigantic pincered worms

Unless you use every viewpoint at your disposal – which takes some time to get the hang of – you're likely to spiral earthwards with alarming frequency

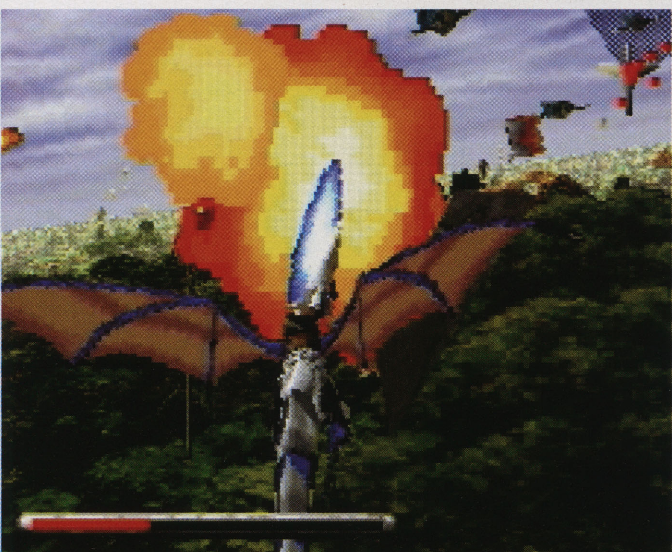




Panzer **features an onboard scanner in the top-right corner which keeps track of enemies and shows your current view (top and above)**









Panzer's artists have drawn upon many influences to create the game's unique adversaries (top, left and right). Things are getting hairy (above). The forest level (level five) features trees of varying heights (inset right)



compass, while the A,B and C controls dictate the distance from which the action is viewed: 'in-character', close or far. And the views aren't cosmetic touches but a fundamental part of the gameplay. Unless you use every viewpoint at your disposal – which takes some time to get the hang of – you're likely to spiral earthwards with alarming frequency.

There's little doubt that *Panzer Dragoon* is an inventive game – other Saturn developers will be hard-pushed to match its overall design let alone its technical feats – but there's a danger that it will end up subscribing to the same unfortunate values as *Clockwork Knight* (**Edge** 17). It's unlikely that Sega will fall into the ease-of-completion trap again, but it could face problems disguising the underlying shallowness of *Panzer Dragoon*'s gameplay.



Level one's paddled airship turns up again later in the quest. As with all confrontations with larger enemies, the game forces you to attack it from all angles – regular viewpoint flipping is required

Daytona USA



After its arch-rival Namco's successful conversion of *Ridge Racer* for the PlayStation, Sega has a lot to prove with the Saturn version of *Daytona USA*

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**AM2**
Release date:	**Spring '95 (Jap)** **Autumn '95 (UK)**
Origin:	**Japan**







***Daytona USA* is now 45% complete. Most of the graphics from the first track are included**





Saturn *Daytona* runs in Saturn's standard 320x224 mode. The frame rate is expected to remain at 30fps

The battle between Sega and Namco for domination of the racing game market is set to move from the arcades into the home with the Japanese release of Saturn *Daytona USA* in the spring.

The team behind the project, Sega's AM2, was also responsible for the *Daytona* coin-op as well as other Sega arcade classics like *Out Run*, *Virtua Fighter* and, more recently, the dazzling *Virtua Fighter 2*. For this conversion, AM2 was split to create a group dedicated solely to Saturn development, which was in turn divided into two teams charged with converting *Daytona USA* and *Virtua Fighter 2* respectively. However, such is Sega's urgency to release *Daytona* that *Virtua Fighter 2* programmers have been drafted in to help keep it on schedule.

In early February the game was about 45% complete. AM2 has now



Nobody doubts AM2's skills, but many are already wondering if the Saturn's twin SH-2s will be enough to handle graphics of such complexity as *Daytona*'s

Due to technical limitations, AM2 has been forced to produce the Saturn version using the machine's lower screen resolution of 320x224

incorporated working gauges, including a track position indicator, lap timer and full tachometer, and game mechanics such as the multiple view option are also in place. The most obvious changes from the coin-op are a tweaked layout for the game screen and some new graphics to make the backgrounds more recognisable.

Thus far, only the beginner course has made it into the home version – AM2's priority was to get the graphics engine up and running before ploughing on with the translation of the intermediate and advanced courses. However, work is now set to begin on the more complex scenery of the advanced and intermediate tracks (see page 35).



Multiple views (above and above right) have now been added to the game



Surprisingly, even coin-op details like the spinning fruit machine barrel remains intact in the Saturn version

Due to technical limitations, AM2 has been forced to produce the Saturn version using the machine's lower screen resolution of 320x224. The coin-op's crystal-clear display has a resolution of 496x384, but the sheer amount of polygon shifting plus the extra burden of texture mapping necessitated the switch to a lower level of detail for the Saturn. The inevitable result is that the track looks rather jagged, the cars appear chunky and finer details such as cloud reflections on car windows look blockier.

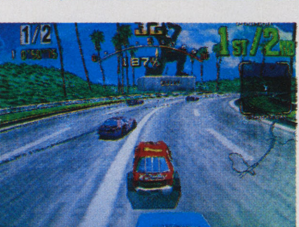
It's likely that creating a 3D title of this size will present a number of technical problems for the Saturn's sequential 32bit processing architecture and lack of a dedicated geometry engine. In terms of raw specs at least, it's difficult to see just how Sega's

Continued next page

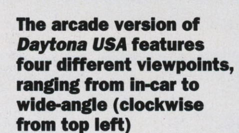
prescreen











The arcade version of *Daytona USA* features four different viewpoints, ranging from in-car to wide-angle (clockwise from top left)



The coin-op's crisp 496x384 display will be missing from the Saturn version. Some of the game's subtler qualities (micro texture, reflections, etc) will also be absent

machine will be able to match the level of graphical excellence seen in PlayStation *Ridge Racer*.

AM2's goal is a healthy frame rate of 30fps. At this stage, each car is constructed from around 160 polygons, with another 2000 polygons dedicated to the rest of the game's environment. AM2 maintains that some advance clipping techniques will prevent the glitching that marred *Virtua Fighter*'s visuals, but the game is still a long way from matching the coin-op's graphics.

In the arcade, *Daytona*'s dedicated graphics processors generate an amazing 5000 polygons per frame, every 1/60th of a second. Like the PlayStation, the Model 2 architecture has a custom 3D matrix (geometry engine) for calculating polygons, but it also uses customised algorithms built into the board to enable it to generate such effects as the reflections of the sky in the cars' windows.

But there is hope for those dubious about the 3D performance of Sega's hardware. While the Saturn has yet to prove itself in this area, the calculating power of the CPUs themselves (the SH-2 is one of the fastest chips when it comes to performing the floating-point calculations necessary for 3D graphics) could yield some surprising results. With a concerted effort to develop efficient, low-level 3D code (the programmers are using assembler for core routines), AM2 should be able to maximise CPU throughput and work around any hardware limitations. *Panzer Dragoon* goes some way towards showing that the machine has considerable potential when its power is tapped in the right way. Whether the extra processing that *Daytona* demands will prove too much will become clear in a few months.

Despite the lack of finesse in the visuals (remember, *Ridge Racer* didn't look that special until it arrived), Saturn *Daytona* seems like a generally convincing representation of the coin-op. Certainly, there's little doubt that AM2 will be able to deliver the coin-op's playability – a factor just as important as its graphics in making it one of the most successful arcade games of all time. **E**

AM2 maintains that some advanced clipping techniques will prevent the glitching that marred *Virtua Fighter*'s visuals

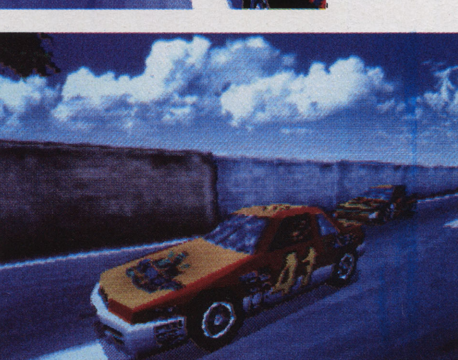




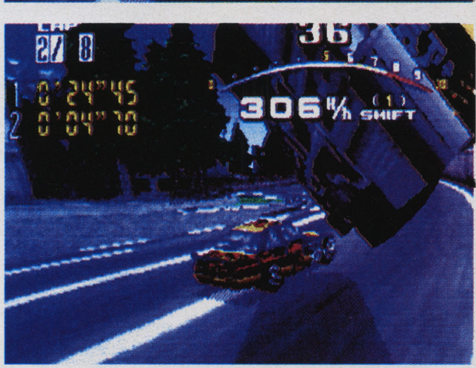
Graphics aside, one thing that will give *Daytona* a massive lead over *Ridge Racer* is its multiplayer option. A sevenplayer adaptor (above) will be released around the same time as the game, but will it be supported? A Sega steering column (top) should also be available

Continued



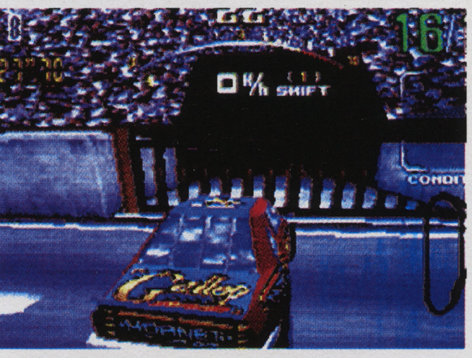






These shots are from a slightly earlier version of the game (40% complete), but they include a wide variety of cars and some impressive detail





So far, AM2 has concentrated on translating the graphics from the oval beginner track, but the team has already begun on converting some of the graphics from the advanced tracks (top). Expect some serious progress to be made over the next few months

RenderWare®

"Real-time 3D graphics library for Games"

RenderWare for:

- Real-time 3D rendering
- Perspective texturing
- Gouraud shading
- Complete interactivity
- Support for 3DS and DXF formats.

Now Available for:

- DOS
- Windows 3.1
- Windows 95
- Windows NT (Intel and PPC)
- Mac and PowerMac
- Consoles coming soon

Catch the real-time 3D graphics wave



Up to 116,000 triangles/sec on a P5/60 in software!!!

There's a new wave sweeping the PC games market, it's called real-time 3D graphics.

RenderWare is the tool that will let you catch the wave and dramatically reduce the development time of your games.

RenderWare is the software-only 3D graphics engine that delivers real-time 3D graphics, on standard PCs, without the need for a hardware accelerator. What's more RenderWare transparently takes advantage of 3D graphics hardware acceleration when it is present.

RenderWare has hundreds of licensees worldwide, and has become the accepted solution for real-time 3D graphics.

SEE FOR YOURSELF - Demos and information are available from ftp.canon.co.uk and http://www.canon.co.uk/csl/cslhome.html You can email questions to info@criterion.canon.co.uk

RenderWare is available with a 30 day no quibble money back guarantee.

To order RenderWare please call:

Phone: +44 (0) 483 44 88 33 *Fax:* +44 (0) 483 44 88 11 or *Email:* order@criterion.canon.co.uk



A Canon Company

Heretic

Edge gets its claws into a title that adds new scenery and characters to the legendary *Doom* gameplay

Format:	**PC**
Publisher:	**id Software**
Developer:	**Raven Software**
Release date:	**Out now**
Origin:	**US**

The variety of enemies in *Heretic* encourages excessive violence. The selection of weapons provided makes the task easier

Although *Doom*'s game engine appeared well over a year ago, it's still unsurpassed in terms of popularity. Not only do custom *Doom* levels appear daily, but now id Software has licensed Raven Software to produce an entirely new game based on an enhanced version of the engine.

Heretic is a fantasy incarnation of the original sci-fi bloodfest. At first it looks too much like *Doom* for its own good: the three-episode structure, the playing keys and the shapes of the scenery mirror *Doom* exactly. But you soon discover that this game has a character all of its own.

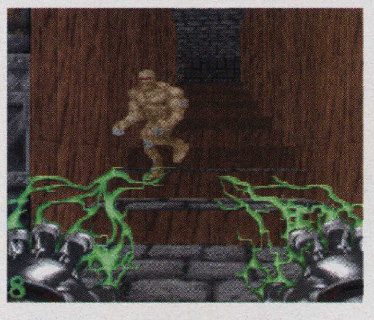
The most important aspect of 3D maze games like this is the range of enemies – *Doom* was exciting because you never knew what fiendish beast was lurking around the next corner. True to form, *Heretic* offers a variety of devils, dæmons, golems and skeletons. Exterminating them is rewarded by lashings of gore and the opportunity to obtain more powerful weapons.

The level design is as fiendish as *Doom*'s, with access to certain areas only available by means of keycards and secret doors. The ability to look up and down at any time is a bonus, although it's generally not needed.

For those lucky enough to be equipped with an IPX network, *Heretic* comes with a new program to simplify launching games and saving parameters. Unfortunately, it still only supports four players simultaneously.

Heretic's options screen replicates *Doom*'s. However, *Heretic* comes with a new network program







A golem explodes and its spirit rises skywards (top). Another bloody mess (above)

The 'Gloves Of The Necromancer' (above) are spectacular but not a particularly impressive weapon

Heretic looks like a worthy successor to the id original. It will almost certainly find favour with *Doom* fans itching for something new to exercise their trigger fingers on.

Now your favourite magazines are on-line.



Future Publishing has extended this magazine onto the Internet. With FutureNet you can talk directly to the editors, check out next month's contents, search back issues, pick up the latest news, buy mail order products and even subscribe on-line!

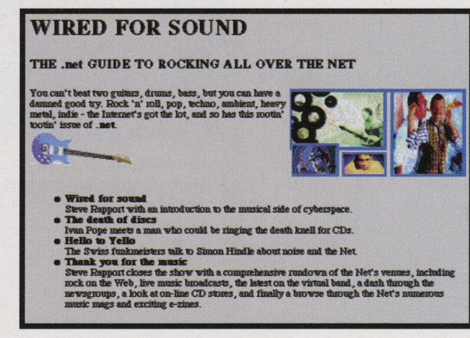
All you need to connect to FutureNet is an Internet account, such as Demon or Cityscape, or a direct college connection. Then simply use your World Wide Web browser to connect. There are no hidden charges – it's completely free!

Point your World Wide Web browser at:

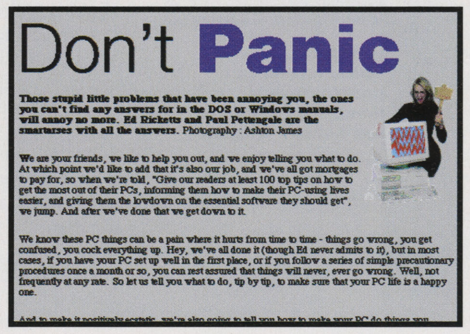
http://www.futurenet.co.uk



FutureNet is Future Publishing's on-line service, featuring information from over 30 magazines.



You'll find the latest information on new issues and forthcoming special offers.



Articles from back issues are available free to search and browse.

To advertise on FutureNet, email **Simon Richardson** at srichardson@futurenet.co.uk or call 01225 442244.

Chrono Trigger

The huge Japanese market for SFC RPGs shows no sign yet of being dented by the advent of the next generation

Format:	**SFC**
Publisher:	**Square Soft**
Developer:	**In-house**
Release:	**March 11 (Jap)**
Origin:	**Japan**

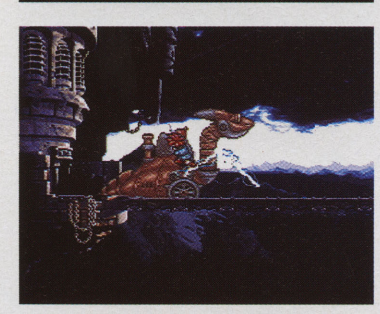
In late 1994, Square Soft's cartridge sales hit the ten million mark – a figure that most console publishers can only dream of. And it reached this landmark by repeatedly delivering just one type of game: RPGs.

After its *Final Fantasy* and *Seiken Densetsu* (known to Western gamers as *The Secret Of Mana*) series comes *Chrono Trigger*, the culmination of two years' work by a team of designers who have attained almost legendary status in their native land.

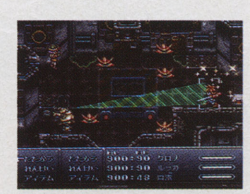
Chief designer Horii Yuuji could justifiably claim to know console RPGs better than anyone, having been behind *Dragon Quest* parts 1-6 – Japan's most popular examples of the art to date. He is flanked by Akira Toriyama, probably the most praised comic book artist working in Japan today and responsible for the hugely successful *Dragon Ball Z* animated series; and Ironobu Sakaguchi, Square Soft vice president and director of the *Final Fantasy* series.

The combined talents of this trio are being lavished on a 32-megabit game based on the adventures of a reluctant time traveller – the 'Chrono' of the title – and his five companions. Their task is to travel between six time zones, righting wrongs in order to reshape history, or even making history by going forward in time.

Chrono Trigger is currently the most eagerly awaited game in Japan. It's easy to see why it has generated such interest: its luscious graphics and the undisputed abilities of its creators are the perfect recipe for another first-class Square game.



From top: facing the Inquisition; the heroes stop for a breather; the action occasionally switches to a side view







From top: tin-plated Robo lets fly; the almost obligatory Mode 7 section; one of the game's six time zones

Jumping Flash



***Jumping Flash*'s detailed polygons (above, left) take 3D platformers into a new era**

The overhead perspective allows more accurate landings and provides a look at your own feet

3D polygons are about to give the humble platformer a new lease of life

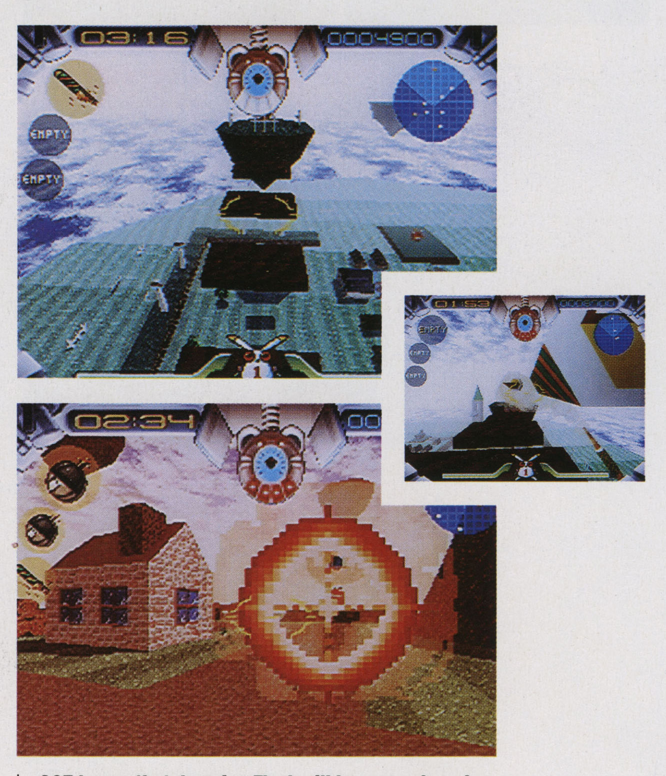
Format:	**PlayStation**
Publisher:	**SCE**
Developer:	**In-house**
Release date:	**April (Japan)**
Origin:	**Japan**

In early 1994, one of the first graphic demos for the PlayStation was a 3D platform game with the provisional title *Spring Man* (**Edge** 9). Now being launched as *Jumping Flash*, it could well revitalise a well-worn genre.

Jumping Flash looks like an idiosyncratic combination of *Motor Toon GP* on the PlayStation and *Pilotwings* on the SNES. Taking to the skies as a half-rabbit/half robot creation called Robit, you bounce and run through an exceptionally smooth aerial platform maze in search of an evil scientist. The plot may sound suspiciously like *Sonic*'s but the action is reassuringly different.

An amusement park, a volcano, an ice cavern and an historical park – all modelled in textured 3D – provide the game's backdrops. These are crammed with fire-spitting insects and various animal enemies which Robit has to fight. He can jump and drop but it's his ability to turn in mid-air that makes him different: while in flight, he can change direction and even look down at the ground.

After the disappointment of *Motor Toon GP*, *Jumping Flash* could provide SCE with its first home-grown winner.



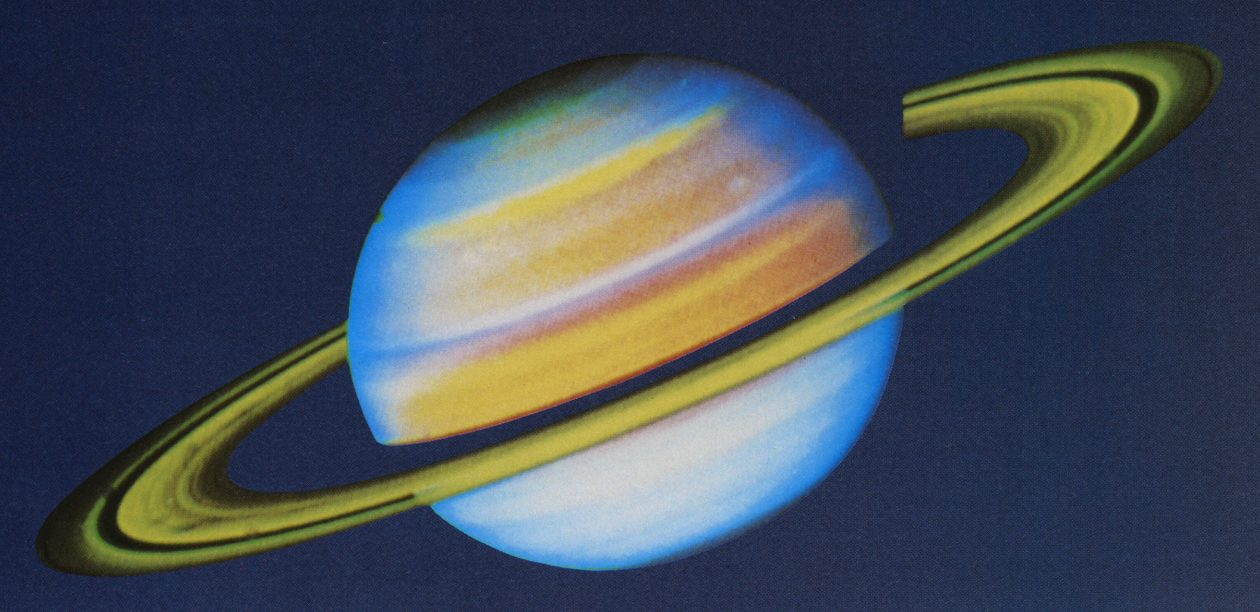
SCE hopes that *Jumping Flash* will be remembered as the first appearance of a new platform star with the same longevity as Sonic or Mario

Develop games on Saturn.

(Spaceship not included)



To launch games developers into the new age of entertainment, Cross Products is proud to announce that SNASM2 Saturn development systems are now available. Check out the features below and then give us a call so you can join us in running rings around the competition. With prices starting at £3,000 + VAT SNASM2 Saturn development systems offer the following:



- A complete system: you get the Saturn, the interface hardware and the software tools, so you just need a PC and a programmer and you're in business.
- The interface hardware we supply forms part of an open inter-face standard, so it supports other tools such as sound editors and artwork designers which are already available from Sega and third parties, with many more products planned for the future.



- The interface hardware has its own RISC processors to avoid burdening the processors you're trying to program with debugging tasks, and it uses a high-speed SCSI-2 interface so you get ultra-fast downloads and slick debugging.
- You can rapidly port existing code, or code samples, as we support GNU and Hitachi syntax in addition to our powerful SNASM2 code syntax!
- The interface firmware is in flash memory so that any updates that may be required can be quickly and easily perfomed on-site without needing to return systems for upgrade.
- Programmers don't want to worry about adding code to allow the debugger to work (or to worry about remembering to remove it for production!) so our hardware uses NMIs to the processors in the Saturn so you remain in control without extensive code changes.
- The system includes assemblers for SH2 and 68000 processors, a powerful multi-processor linker, GNU C compiler so you can work in any mixture of C or assembly language with full source-level debugging facilities being provided by our advanced SNASM2 remote debugger.
- Can be used with a Programmer's Small Box, or we can supply a production Saturn which is modified to allow it to be used with a CD emulator such as the Sega recommended V-CD (which we can also supply!).
- Our debugging systems have been designed to work alongside the Saturn CD BIOS so you get full access to the CD features without having to jump through hoops.
- With SNASM2 you get backup of a company which has been supplying and supporting games developers for over five years. Dedicated support personnel and a large team of hardware engineers and programmers are continuously enhancing our products to make developers more productive.



For more details on SNASM2, call Cross Products. Tel: (0)113 242 9814 Fax: (0)113 242 6163

ltd

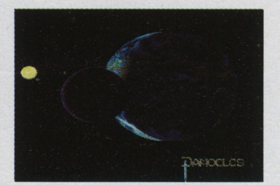
Damocles

Format:	**PC CD-ROM**
Publisher:	**Psygnosis**
Developer:	**Novagen**
Release date:	**May**
Origin:	**UK**

PC owners with CD-ROM drives can now reap the benefit of Paul Woakes' demonstrable expertise at producing complex, involving and playable games



Although *Damocles*' graphics aren't shadowed or even light sourced (on planet surfaces), the level of detail and the texturing makes it feel particularly solid



The *Damocles* universe calculates which parts of the planets are in daylight



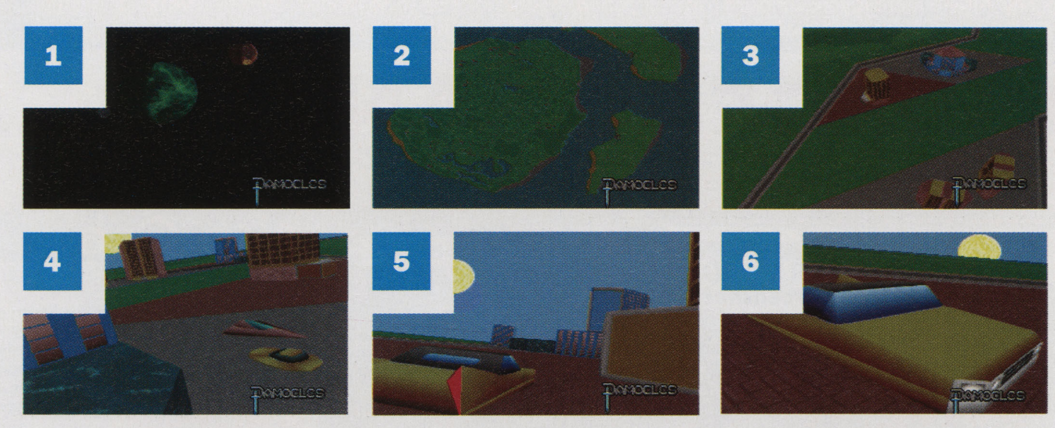
Fully shaded, fully textured, and with realistically calculated movement paths, the *Damocles* solar system goes far beyond the bland deep-space environments of games like *Wing Commander 3*

Novagen's *Mercenary* series represented the pinnacle of 3D gaming on machines like the C64, Atari ST and Amiga. Now, almost a decade since the original *Mercenary* appeared, *Damocles* – the second title in the trilogy – is to be converted to the PC with the addition of a range of visual bells and whistles.

Programmer Paul Woakes has developed a very individual game style which gives the player full 3D environments to discover and explore, from underground tunnels to wide-open cities and deep space. A number of vehicles can be commandeered to traverse the various environments, allowing you to discover missions, puzzles, quests, clues and objects. It's very much an adventure based system, but the realtime graphics and full freedom of movement give *Damocles* a simulation-like edge.

Like Woakes' original 3D visions, the aim of PC *Damocles* is to immerse the player in as virtual an environment as possible without the aid of extra equipment (though Novagen does intend to support major VR helmet standards). This acute feeling of 'being there' isn't down to a flash 3D graphics engine (although *Damocles*' highly detailed graphics are fine) or any other clever programming tricks. It's just that Woakes understands how to construct a believable, living environment. From the detail of a street lamp to the layout of an entire solar system, *Damocles* is fascinating simply as an exercise in simulaton.

The level of detail and the true scale of the thing is brought home by



1 Entering Dion's atmosphere. 2 Birmingham Island appears beneath you. 3 Closer to the surface, you see Birmingham Island's commercial centre. 4 Notice that even road networks are fully mapped out. 5 Right down on the planet surface. 6 A '99 Chevy – just one of the many vehicles the player can use to traverse the gameworld



In this scene you're Flying low over the Atropos moonbase as the planet Dion rises slowly over the horizon



Coming in low for a skyscraper fly-by. One of these buildings may hold a vital clue to help you save the planet from disaster

one of the game's demo flights through the solar system. It begins with a view of a starfield before the camera hurtles towards a planet. The view then changes to below the cloud cover and a whole continent is revealed ahead of you, getting closer by the second. First huge land masses, then cities, then buildings, city streets, and grassy plains resolve as the camera zooms downwards, pulling up at the last moment, performing a flyby of a shoreside town, then darting back off into deep space towards a nearby moon. It's an exhilarating ride.

Such is Paul Woakes' dedication to the actual game environment that he never even begins to work on puzzles, situations or storylines until he's created the big picture. The game structure isn't actually a problem with *Damocles*, though, because the plot, puzzles, and basic environment have all been reproduced from the Amiga original. This may provoke criticism from some quarters, but Novagen is confident that the winning formula of the Amiga game is more than enough to satisfy PC owners.

The plot takes place in a nine-planet, 19-moon solar system whose fifth planet is threatened by the comet Damocles. The player's task is to avert this disaster, but with no easy solution in sight and a whole solar system to explore, the route to success is long and packed with sub-plots, diversions, and startling developments.

Because *Damocles* offers a fully fleshed out game world, the player has total freedom to interact with anything, and there's rarely one solution to any problem. The result, as Novagen's **Bruce Jordon** explains, is that 'the player determines their own end of game. They can potentially possess everything worth playing for, or they can conceivably have destroyed all that was there to play with.'

You could almost call it 'Sim Solar System'.





One of *Damocles*' greatest assets is the way objects retain clarity even when far off in the distance

BUY NOW PAY LATER.

YOURS FOR 6 MONTHS BEFORE YOU PAY A PENNY NO STRINGS ATTACHED

Voted the number 1 games system. The all new Jaguar DOOM PACK has at last arrived in Calculus Stores, complete with the latest software direct from the States. Every Jaguar sold by Calculus comes with a FREE copy of Cybermorph. So, don't hesitate when you could be taming a Jaguar for 6 months before you pay a penny. But maybe you're a SEGA freak, No problem, Calculus have the answer with the new 32X, buy it now and blow your mind for 6 months before you pay a penny.

CALCULUS

ANY GAMES CONSUL ... TRADE IN DEAL...



* 64BIT * 16.8 MILLION COLOURS
* 16 BIT CD QUALITY SOUND
Includes Doom- the Cult Software Title

DOOM PACK

£199.99

FINAL REDUCTION SALE PRICE

Doom Pack includes DOOM & Cybermorph

Jaguar with Cybermorph £179.99

NEW CD ROM DRIVE

With the addition of the New Jaguar CD - Player you will instantly access the exciting world of CD Technology.
New Games taking full advantage of a CD disks massive storage capacity and full Motion Films(using the new FMV module).



JAGUAR SOFTWARE BLITZ

Dragon Bruce Lee Story	£42.99	Wolfenstein	£39.99
Alien vs Predator	£48.99	Cannon Fodder	£44.99
Club Drive	£42.99	Tempest 2000	£42.99
Chequered Flag	£48.99	Kasumi Ninja	£54.99
Doom	£59.95	Syndicate	£44.99
Theme Park	£44.99	Soccer Kid	TBA

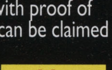
Jaguar Controller £19.99

ATTENTION SEGA Megadrive Owners

Upgrade your Megadrive with the NEW Sega 32X and receive 5 vouchers worth £10 each when returned to SEGA with proof of purchase of any new 32X Game. Only one voucher can be claimed per game purchased.

SEGA 32X GAMES

Doom	£49.99
Star Wars Arcade	£49.99
Virtua Racing Deluxe	£49.99
Stellar Assault	£49.99
Cosmic Carnage NEW	£59.99
Super Afterburner NEW	£44.99
Super Space Harrier NEW	£44.99
Metal Head NEW	TBA
Golf Magazine Best 36 Holes NEW	TBA







£139.99

5 x £10 GAMES VOUCHERS

FRONTIER QUAD SPEED DRIVE PACK

INCLUDING 8 CD ROM INTERACTIVE TITLES



QUAD SPEED DRIVES - TOMORROWS TECHNOLOGY

With all major software publishers new generation games and software applications requiring a minimum 600Kb data transfer per second, a Quad Speed drives is a must. No special interface card is required the Mitsumi drive has a 40 pin connector which can be used with a standard IDE and enhanced IDE (ATAPI)

PACK CONTAINS

* Mitsumi Quad Speed CD ROM Drive
Data transfer mode 1: 600K bytes mode
2: 684 K bytes
access time: full stroke 400ms
1/3 stroke 230ms
* 8 Superb CD ROM Titles
* Audio cable and fitting screws

£229 ex Vat

£269.08inc Vat

Includes 8 CD ROM Titles Worth £374.92 RRP

WORLD CUP GOLF An Amazingly accurate simulation of world cup golf, with a 10 player option and 1five alternative championship formats.

NOVASTORM This high flying blast 'em up features dazzling 3D graphics and full Motion Video.

ECSTATICA Help to free Ecstatica in this terrifying, Graphics adventure. Ecstatica is a nightmare that you have not yet experienced.

ALL NEW WORLD OF LEMMINGS Larger Lemmings in crazy costumes.New objectives and for the first time, bad guys to be confronted!!

THE NEW DICTIONARY OF THE LIVING WORLD A complete multi-media guide to our Living World.

VIRTUOSO Welcome to a world of imagination...A world of limitless possibilities...A world so lifelike it's virtually real...

COMPTON'S 1995 INTERACTIVE ENCYCLOPEDIA No more dusty leather bound volumes. This is the most powerful educational tool available.

EXTRACTORS If you liked Diggers you will love Extractors.

CALCULUS COMPUTERS NATIONWIDE

SOUTH

AYLESBURY
39 Friars Square Centre
TEL: 0296 436811

MAIDENHEAD
6 Nicholson Walk,
TEL:0628 770768

HEMEL HEMPSTEAD
Marlowes Centre TEL:0442 250035

FARNBOROUGH
1 Princes Mead Shopping Centre
TEL 0252 377722

MIDLANDS

BURTON-UPON-TRENT
The Octagon Centre New Street
TEL: 0283 517505

COVENTRY
24 Orchard Walk Shopping Centre
TEL 0203 520778

SUTTON COLDFIELD
80 The Parade TEL: 021 355 4839

TAMWORTH
34 Ankerside Shopping Centre
TEL: 0827 67776

WALSALL
48 Park Mall Saddler Centre
TEL: 0922 21700

NORTH

ALTRINCHAM
59 George Street Altrincham
TEL: 061 929 7433

DONCASTER
11 South Mall Frenchgate Centre
TEL0303 349997

LEEDS
11 Bond Street Centre TEL: 0113 2454098

NORTHWICH
85 Witton StreetTEL: 0606 47883

HULL
11 Princes Quay TEL: 0482 585100

OLDHAM
The Spindles TEL: 061 6270822

PRESTON
St George's Centre TEL: 0772 259494

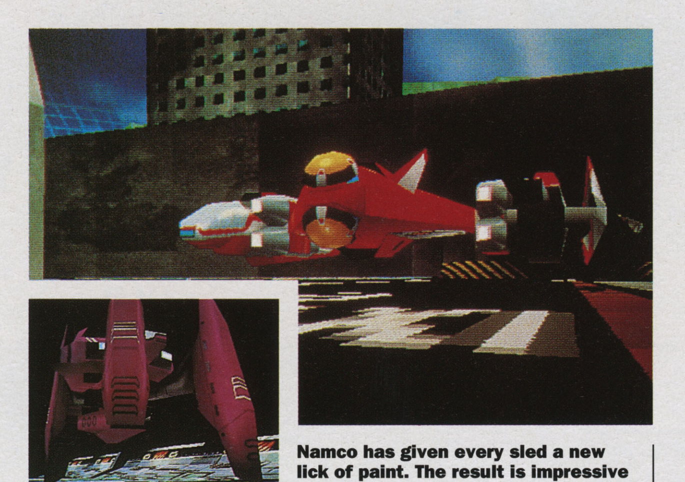
SHEFFIELD
67 The Moor TEL: 0114 2721192

WARRINGTON
52 The Mall Golden Square
TEL: 0925 575055

WIGAN
18a The Galleries Shopping Centre
TEL: 0942 323913

Cyber Commando

It's just possible that *Cyber Commando* could achieve the arcade success that eluded its predecessor, *Cybersled*

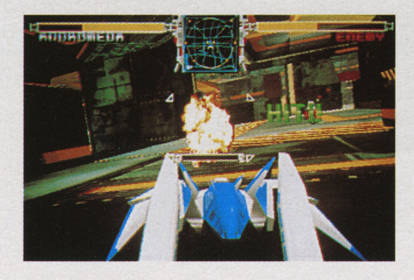


Namco has given every sled a new lick of paint. The result is impressive

Format:	**Arcade**
Manufacturer:	**Namco**
Developer:	**In-house**
Release date:	**TBA**
Origin:	**Japan**

Even though Namco's *Cybersled* boasted pin-sharp System 21 graphics and carefully reworked *Battlezone* gameplay, it gained a relatively slim, almost cult following in the UK. It certainly turned heads wherever it appeared, but those heads didn't stay turned for long: despite an addictive twoplayer mode the game concept was too restricted in scope to assure it mainstream success.

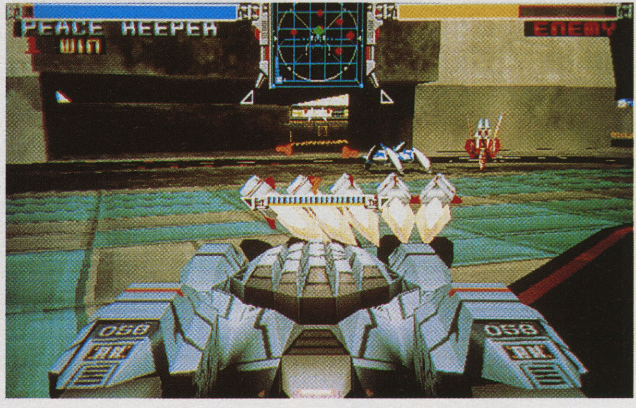
After successes like *Starblade* and *Galaxian³*, Namco will no doubt be banking on the game's sequel, *Cyber Commando*, to generate a healthier level of interest in this interpretation of the 3D shoot 'em up.



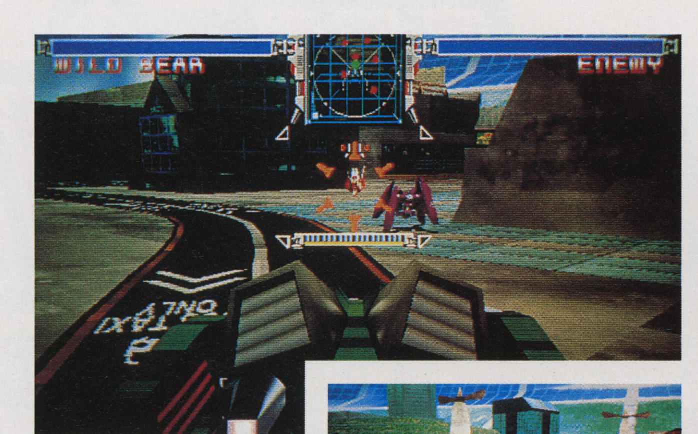
The game's appearance alone will give it a head start. Combat takes place in sinister arenas with Gouraud-shaded, texture-mapped walls and obstacles, which makes for a hugely more atmospheric environment than the garish play areas of the original. And, like the PlayStation update of *Cybersled*, *Cyber Commando* features fully texture-mapped vehicles, thanks to the System 22 board at its core.

Apart from that, the vehicles in *Cyber Commando* are similar to the original *Cybersled* line-up, although their respective strengths and weaknesses have been altered in a bid to distinguish the game from its predecessor. Six types of craft are selectable at startup, each offering different attributes in three categories: weapon strength, vehicle speed and shield strength.

Namco has faithfully reproduced the silken driving feel of *Cybersled*, which will come as a welcome relief to fans of that game



Although *Cyber Commando* shifts a similar amount of polygons to *Cybersled*, the texture mapping makes a significant difference



With the enemy almost in your sights, it's time to loose a missile (above)





Portions of your battle are replayed from various angles (above). Firepower has been aesthetically updated (right)

Namco has dispensed with the concept of selectable combat arenas and instead restricted the number of environments to three, to be tackled consecutively. The first, 'East City', is fairly small, with lots of objects to hide behind. 'Civic Park' is more spacious, allowing more head-on action. The last, 'Central Factory', is reserved for a showdown with the boss.

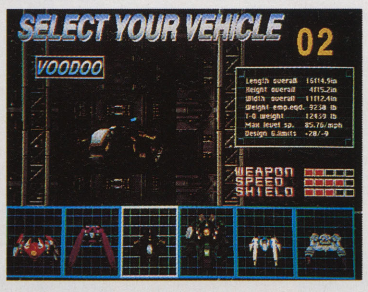
Generally, *Cyber Commando*'s gameplay is very similar to *Cybersled*'s. Namco has faithfully reproduced the silken driving feel of the original, which will come as a relief to fans of that game. However, the fact that the weapons and combat system also remain largely unaltered will be regarded by many as a fault. An extra type of weapon or perhaps multi-level arenas could have enhanced the nearly two-year-old format.

The difficulty level leaves something to be desired, too. The version **Edge** played would have provided little challenge to *Cybersled* veterans, and even virgins to the territory should be able to reach the boss with few continues.

But Namco has worked several new features into the mix. In addition to general replenishment icons, there are now radar jammers which interfere with your onboard scanner, forcing you to get by with the main view only; and shot attractors which draw your fire away from targets.

Namco will be counting on *Cyber Commando*'s optional linkup facility to make it a longterm money-spinner. And with visuals like these – in design terms *Cyber Commando* is way ahead of fellow System 22 title *Ace Driver* – the game should certainly grab people's attention.





***Cybersled*'s cat-and-mouse gameplay has been transferred directly to *Cyber Commando* (left). Each of the six vehicles has its own pros and cons (right): the 'Voodoo', for example, is nippy but has inferior weaponry**

Scorchin' futur



32X £170 + 3DO £300 + Jaguar £250 + NEO-GEO CD £400

e games action!



FIGHTING NINJA'S

Pop and Twinbee

agoon

Gex

Shinobi X

Return Fire

Killer Instinct

TWO PLAYER KILLING FRENZY

MATE PLAYING GUIDE

+  +  +  = £2,520

CD-i £400

PlayStation £500

Saturn £500

Worth of kit

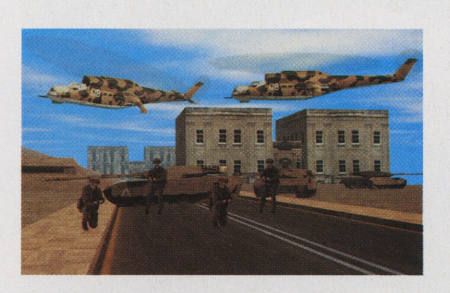
Company report

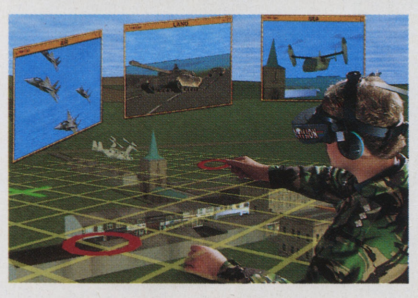
Division's Bristol base (right) is a world-class centre for virtual reality technology



Division

Virtual reality has been filling column inches for years now. But while others have just been talking, a small British company has been making it happen. **Edge** reports from the front line of the VR revolution





These images from military simulators are generated in realtime. Custom equipment can be combined with the helmets to provide physical training – one sim has pedals that stiffen when the combatant is running uphill

There can be few technological concepts that have attracted as much hype as virtual reality. Apparently our lives are about to be revolutionised: we'll cook in virtual kitchens, drink in virtual pubs, and indulge in frequent cybersex (which will, of course, be more fun than the real thing).

But not everyone is giving credence to such sci-fi nonsense. Division is a company that has been a pioneering force in virtual reality since 1989. To one of the oldest names in the business, VR is not just futuristic fantasy; it's a genuine opportunity to change the direction of the entertainment industry. **Edge** visited the company at its Bristol HQ to discover just how it plans to achieve that aim.

'Let's start with what we mean by virtual reality,' says **Kevin Williams**, Division's manager of international entertainment sales and marketing. 'We're talking about an immersive environment that allows someone to manipulate that environment created by the computer. It's not on your TV screen and it's not on your monitor. It's running at 30-plus frames a second, so it's a realworld environment. It's tracking, so wherever you look, you see. And it's manipulative – wherever I extend my real hand I can manipulate that environment. Anything less is just not virtual reality by our criteria.'

Division was founded by a group of ex-INMOS engineers in 1989. At that time, the hardware to produce what chairman Charles Grimsdale knew was possible had not yet been invented.

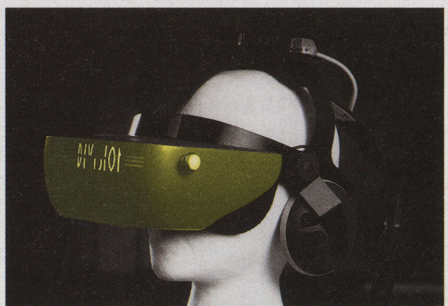
To develop the boards that would be required for today's image generation machines, Division entered into a joint venture with the University Of North Carolina. A group at UNC conceived the PixelPlanes technology that is now at the heart of all Division's virtual reality generators. The general response then was astonishment, and it's an indication of PixelPlanes' power that the competition is only just catching up.

Division computers are attractive to high-end image-generation professionals not only because of the graphical capabilities of the PixelPlanes board but because of their upgradeability. Budgets are no longer the bottomless pit they appeared to be in the late 1980s, and the fast-moving VR field represents a major financial risk. 'The professional market doesn't want to

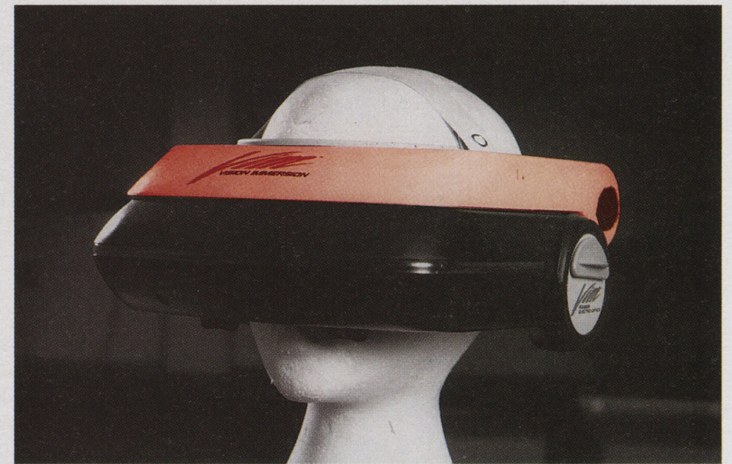
Continued next page

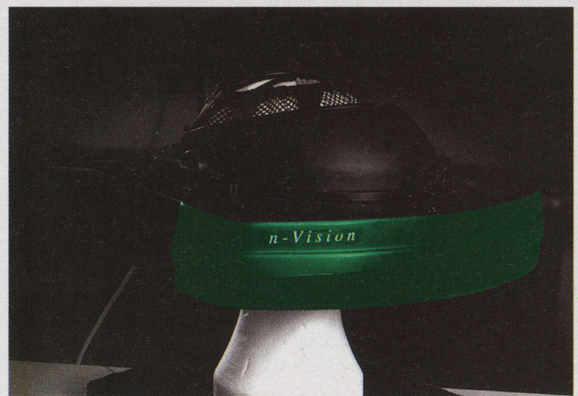
Company report





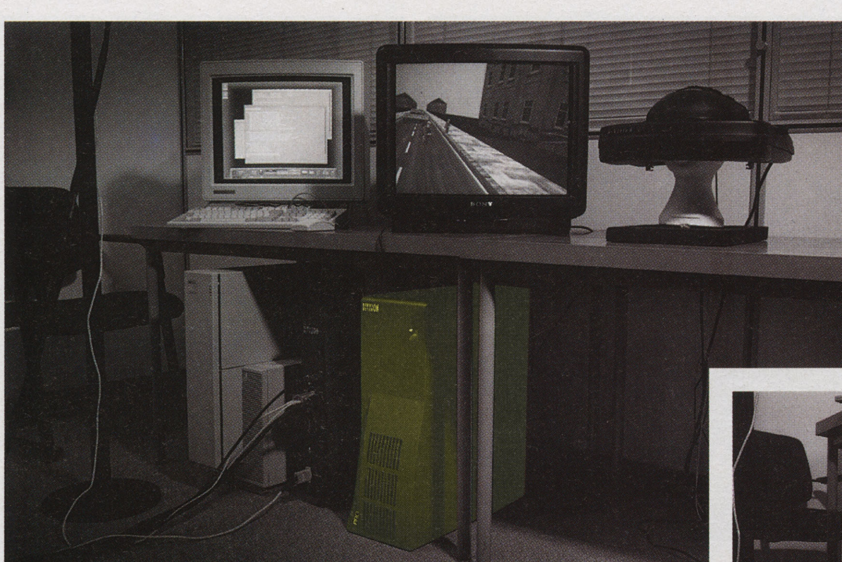






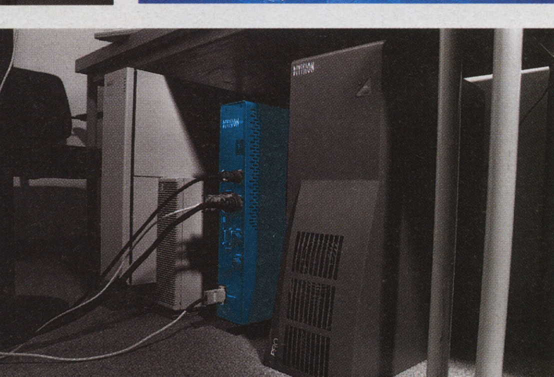
The relatively crude LCDs of Division's first headsets (top) have been replaced by monitor-quality cathode-ray tubes. You pay for the improvement, though: the n-Vision costs over £60,000

The PV100 (centre) and PV10 (right) are both designed to be fully upgradeable. When the PixelFlow board arrives next year, it will slot straight into the chassis





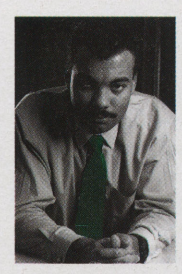
A PV10 (about £30,000) is connected through the IPU (£3500) to an HP workstation (£60,000). Add this helmet (£60,000) and and you've got VR



The 'sandwich' PixelPlanes board (top) fits into standard PC ISA slots. Heavy-duty cabling is required to get it all working (above)

spend an arm and a leg on a machine only to be told they have to dump it in a year's time,' argues Williams.

For this reason, Division has developed a range of modular systems that it supplies to all its clients. The ProVision, a mammoth VR generator, was designed from the outset to be fully upgradeable. At its heart is the PixelPlanes board, costing around $12,000, which is itself a sandwich board based on standard PC ISA architecture. Supporting this is a soundcard, a collision-detection board and a tracking system. Finally, any VR headset can be added to complete the system (not just those manufactured or licensed by Division), allowing users to customise their setup. If technology advances in one area, customers can simply replace the appropriate board instead of being forced to scrap the entire system.



'We're talking about an immersive environment. It's not on your TV and it's not on your monitor. And it's manipulative. Anything less is not VR'

In recognition of the fact that many professional users have already invested money in a base machine, Division also supplies specific tools to add virtual reality capabilities to that unit. Currently, both Silicon Graphics and Hewlett Packard workstations are supported.



The power of the PixelPlanes board, combined with Division's ability to recognise market opportunities, is now taking the company into previously uncharted territory.

'We've intentionally stuck to the professional applications of the science until now,' admits Williams. 'At the moment *dVISE* [Division's VR development software] is mainly used by people in the CAD, engineering, scientific and prototype markets.'

Although Virtuality machines have been installed in arcades around the country since 1992, they have always been aimed at the inquisitive casual punter rather than the serious gamefan. Division intends to change that.

'We're targeting the location-based entertainment market,' reveals Williams. 'People who originally had to use very large, very expensive image generators and now want to open up a lot more sites and need cheap IG per capsule systems.' Division's objective is to sell PixelPlanes graphics cards to LBE (location-based entertainment) OEMs (original equipment

Division's double vision

Division offers two different setups to provide customers with professional virtual reality capability.

The PV100 contains all the silicon required for a fully functional virtual reality platform – customers only need to add a headset of their choice.

However, Division accepts that companies which already have a workstation will not want to fork out for an expensive duplicate system. Enter the PV10, which is essentially a PixelPlanes board with supporting silicon. The only other kit you need in order to use the PV10 is the IPU (Integrated Peripheral Unit), which enables it to communicate with Silicon Graphics and Hewlett Packard workstations.

Continued next page

Company report

Continued

manufacturers), who will use them for their capsules and develop software on them.

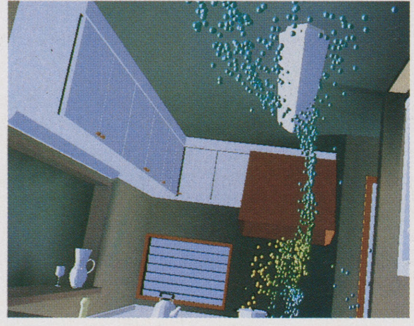
It is this attempt to make real money rather than satisfy a few curious onlookers that led Division to form an alliance last year with American games firm Virtual World Entertainment, developer of the Battletech chain of LBE centres. VWE is now using the expertise it has developed in this field as the basis for a multiplayer coin-op which could place both companies on the arcade map.



'Multiplayer games are hot property these days, and the more immersive the environment, the better,' explains Williams. 'We have to offer the customer a much more intense experience. They have to be better than *Daytona* nowadays.'

The Division/VWE team has now almost completed a PixelPlanes-based version of *Battletech*, which is scheduled for a March release in Japan (sites in the US, Australia and London are planned for later in the year). Rather than use headmounts, the game ties the Division machines to monitors within a fully enclosed and mounted combat pod. Within this are the joysticks, controls and buttons with which the 'mech' is operated. Up to 16 pods can be connected simultaneously, and each game will last approximately ten minutes.





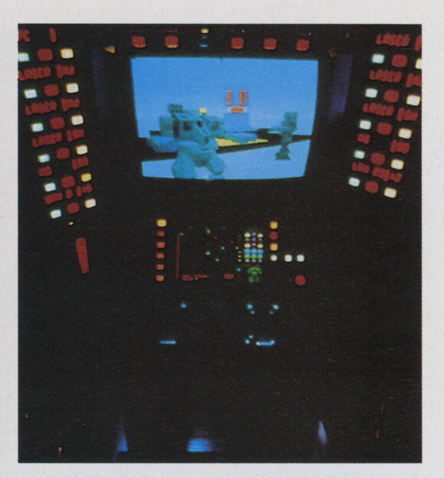
Mistakes in virtual surgery are never life-threatening (top). Airflow modelling (above)

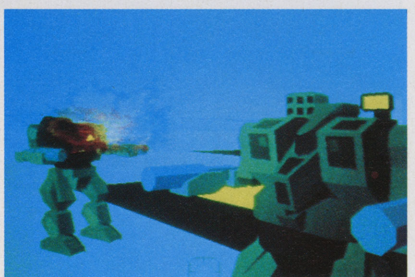
Division has another title aimed at pocketing arcade revenue. *Virtual Odyssey*, developed in conjunction with Kaiser ElectroOptics, is a VR pool game in which the player is placed inside the cue ball. Cynics might well point out that you could simply visit the local pub and have a proper game, but those who've played *Virtual Odyssey* have been impressed.

Division has been at pains to ensure that its machine meets the arcade requirements of portability and upgradeability. The technology fits neatly into a single cabinet, and all necessary cables for ceiling connection are included in the package. To minimise the need for instructions, the controls are simple and mounted on the armrest. The helmet itself is easy to fasten quickly, so there's no need for a revenue-consuming lackey to help the punters out.

When the unit's game ceases to become profitable – six months in a typical arcade – new CD software can be added. To ensure a steady supply of games, Division is actively encouraging people to approach it about buying its Merlin arcade and LBE development system. It hopes to build around 15 machines a month.

Although the gap between consoles and arcades is narrowing, the quality difference between home and arcade headsets remains huge. *Virtual Odyssey* uses a VIM headset, manufactured by Kaiser ElectroOptics and costing around £9000. It offers SVGA display quality, with colour filters and holographic mirrors designed to provide greater realism and a wider field of view for the user.





***Battletech* (above) has been updated by Division. 16 players, each in a separate cockpit, engage in a ten-minute slugfest**

With a single unit priced at £15,000-20,000, this new system is too expensive to be a mere gimmick. It proves that Division is serious about arcade VR.

So what does the future hold for the still fairly marginal virtual reality market? At the moment Division is developing silicon for its next generation of IGs. Paper calculations on its forthcoming PixelFlow board indicate that it will be capable of ten times the performance of PixelPlanes and will eventually be available for a similar price. PixelFlow also offers anti-aliasing capability (absent from PixelPlanes) and special routines for generating spheres at high speeds. It should be available within a year.

It looks as if the much-derided term virtual reality – 'Everybody who's doing 3D is now calling it virtual reality,' mocks Williams – will soon enjoy a second chance. The potential is obvious, the processing power will soon reach the level required to make the whole thing viable, and the public's curiosity has already been piqued. VR is virtually here; the only thing that's needed now is for hardware and software manufacturers to deliver the reality.

63% of the market makes it a standard. 40,000 users with individual needs make it anything but!

Autodesk 3D Studio Release 4.
Today's 3D animation/CAD visualisation software – it's as flexible as you are.

Autodesk 3D Studio – quite clearly it's the open standard for professional 3D graphics and animation.*

But, in the practical sense, it's about as standardised as it's many thousands of users worldwide.... All of them have their own needs, their own imagination, their own creativity. And 3D Studio is flexible enough to work with them on their specific tasks. Now, 3D Studio Release 4 puts even more 'individuality power' at your disposal.

So – whether you're working with CAD visualisation or video-graphics – you'll find its flexibility a true match for your own.

We've achieved this by creating six new 'plug-in' modules which give 3D Studio Release 4 a tremendous increase in productivity....

- *Fast preview renderer.* A faster way to see a key framed animation or a stationary model – render a preview in seconds.
- *Perspective camera matching.* Easier placing of 3D models in the correct perspective on top of a digitised background.
- *Keyframe scripting language.* A new way to 'drive' the Keyframer in 3D Studio – for accurate or data driven animations.
- *Inverse kinematics.* Animating linked objects – more simply than ever before.
- *Encapsulated Postscript output.* Now 3D Studio users can output a raster Postscript file at render time.
- *Image Browser.* Lets you see thumbnail representations of material maps or images within 3D Studio.

...And as well as all this, 3D Studio supports network rendering and gives you high end workstation features and quality at PC prices: giving you more time to let your creativity flow.

So move into a more flexible future today – with Autodesk 3D Studio Release 4. For more information, or the name of your nearest Autodesk Authorised 3D Studio Dealer, call: 01483 300077.



*3D Studio market share: 63% in 1993. (Source: Roncarelli Report on Computer Animation)

Apple Computer



The ripe stuff

Apple's growth over the past 20 years has been phenomenal. But now, as it reaches maturity, the maverick of the computer industry is going mainstream. **Edge** explores the history of the company that caused a revolution

For a company that has been jealously protective of its proprietary technology for so long, 1995 will be a radical year for Apple. The appearance of Mac clones, the launch of Bandai's Power Player – based on a runtime version of the Mac OS – and continuing development of the common hardware platform with IBM, Motorola and others represent less a tactical shift for the company than a complete revision of its rulebook – and, in some senses, a gamble. But since its inception 15 years ago, Apple has always had a certain visionary nature.

Super Bowl Sunday, 1984, and Apple chooses the break at the end of the third quarter to run an ad for its new computer. This is the most expensive piece of airtime in the world, clocking in at $1 million for 60 seconds. The advert features an Orwellian scene, directed by Ridley Scott and with the same stark, bleak images that peppered his Bladerunner. Slack-jawed drones in a drab, monochrome world stare numbly at a ranting dictator filling the screen above them. The sense of claustrophobia and oppression builds until suddenly a woman – the only piece of colour in the place – is seen running through the auditorium pursued by security police. Defiantly, she lets fly with an Olympic hammer. It arcs through the air and smashes into the screen, which shatters into thousands of fragments. Then the voice-over cuts in: 'On January 24, Apple Computer will introduce Macintosh and you'll see why 1984 won't be like 1984.'

It was an advert that got people's attention. Phones rang off the hook at the network, the advertising agency and at Apple. News broadcasts, including the BBC's, elevated its screening to the status of a news item. The advert, everyone agreed, was simply revolutionary.

> It got people's attention. Phones rang off the hook at the network, the advertising agency and at Apple

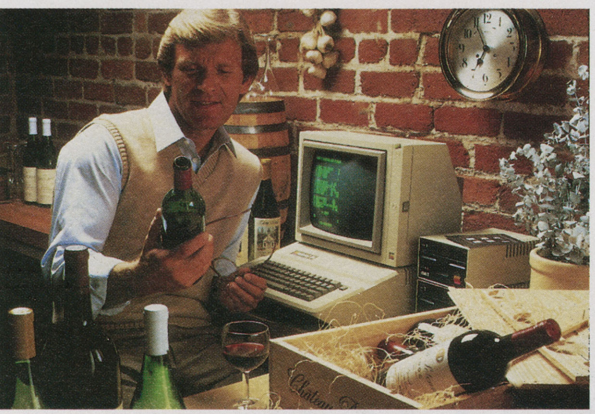
But if the commercial broke the rules to make an impact, that was nothing compared to the waves the Macintosh was about to make in the personal computer market. Just over a decade down the line, the original Apple Mac looks primitive. Its CPU was a Motorola 68000 running at approximately 8MHz. It had no hard drive, just 128K of RAM, 64K of ROM, one 3.5-inch disk drive, and a nine-inch black-and-white monitor. And there were only three pieces of software available for it at launch: *MacWrite*, *MacPaint* and a spreadsheet application from Microsoft. Not only was it it not compatible with IBM machines (a huge drawback in marketing it to corporate America) but it was also incompatible with its immediate ancestor, Lisa, and with Apple's bestselling product, the Apple II. What it did have, though, was a mouse, a high-res screen and the most innovative graphical user interface (GUI) seen outside a research lab.

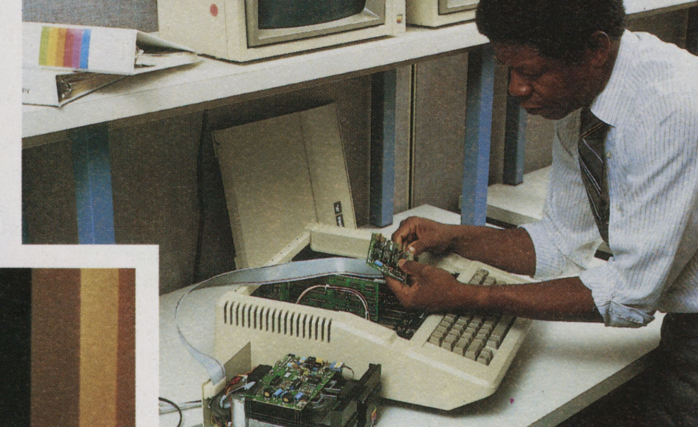
Since then, Macs have been notoriously underspecced and overpriced compared to IBM PCs and are only now managing to achieve parity. But despite the machine's disadvantages, there are now about 17 million Macintoshes worldwide. And most of that is down to the WYSIWYG GUI. What You See Is What You Get.

Apple was founded on April Fool's Day, 1976, by Steve Jobs and Steve Wozniak, two kids who grew up in the

Continued next page

Apple Computer



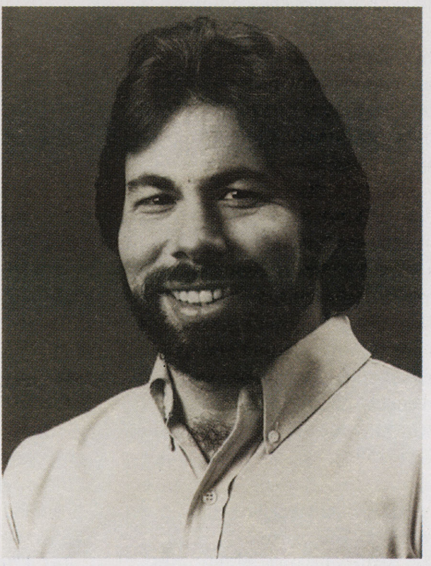








Thankfully, Apple's image has become slightly trendier since the 1970s. The Apple I (centre right), the Apple II (top left, and right), and the disastrous Apple III (above and middle) were superseded by the Macintosh



Steve Wozniak (above), co-founder of Apple with Steve Jobs, was the principal technical talent behind the company's early machines

strange atmosphere of the nascent Silicon Valley, a culture that mixed post-60s hangover with the new dawn of technology. Both were loners and both had an almost obsessive fixation on electronics. Their first business venture together, earlier in the decade, had been in 'phreaking', or phone hacking, selling 'blue boxes' that Wozniak (almost universally know as Woz) had designed in the dorms at Berkeley, where he was studying engineering. Woz's boxes cost $150 to buy; most others cost $1500 to make.

Then Woz stumbled across the Homebrew Computer Club. The club had been established due to the interest generated by what was really the first personal computer, the Altair 8800. The Altair was a kit and there wasn't really an awful lot that you could do with it, but with the idealistic notions of the 1960s still rattling round the Valley, it was regarded as having the potential to cause a revolution. This was the opportunity to take technology out of the grasp of the big corporations and put it into the hands of ordinary people, and a lot of folk from Silicon Valley institutions like Hewlett Packard and the Stanford AI labs started turning up at Homebrew and sharing what was (supposedly) highly confidential business information.

Woz was working at Hewlett Packard and moonlighting over at Atari, where Jobs was employed (the duo created *Breakout* for the company), but he still couldn't afford an Altair or even the Intel 8080 chip that powered it. Then MOS Technology brought out its 6502 microprocessor for a mere $25 and Woz wrote a BASIC interpreter for it, using that as the kernel for a computer that could outperform the Altair while using a fraction of its hardware. This was to become the Apple I, which was essentially just a circuit board with 4K of onboard memory. HP, to which Woz offered it first, thought it too Mickey Mouse and many members of Homebrew were equally dismissive, thinking that the Intel microprocessor was the way forward. Jobs, however, was excited and persuaded Woz to go into business.

Jobs sold his Volkswagen van and Woz his Hewlett Packard programmable calculator and the pair managed to raise about $2000 between them. Their first order came from The Byte Shop, a Silicon Valley store run by a Homebrew member, who wanted 50 Apple Is. They started assembling the boards in Job's sister's bedroom, moved production down into the garage, and knocked them out for a price that has had evangelists foaming at the mouth ever since: $666.66.

Woz was the engineer but it was Jobs who had the vision. By the beginning of 1977, with the Apple I selling in 10 stores in the US, he'd managed to pull almost $350,000 of venture capital into the fledgling company.

Separating the early history of Apple from the lives of Wozniak and – in particular – Jobs is incredibly difficult. A powerful mythology has grown up around the early days of the company, and while Woz is often portrayed as a hi-tech, hippy-skewed upgrade of the classic absent-minded boffin stereotype, Jobs is often sketched as an almost Messianic figure. A socially clumsy, egocentric, wild and often rude Messiah, admittedly, but also someone who could hold an audience in the palm of his hand and sell them his visionary dreams for the future.

Apple was certainly stamped with his personality. Jobs saw much of what they were doing (particularly the introduction of the Macintosh) as giving computers to the people. Giving them the liberating technology to do what they wanted. Apple was the pioneer and companies like IBM were the enemy: sluggish, hidebound and ready for extinction. 'I've never trusted a computer I couldn't lift,' went the joke.

Inevitably, as Apple grew and became more corporate, this spirit gradually faded. Woz jumped ship, rejoined and then jumped again. Jobs was pushed out in mid-1985 by John Sculley, the man he himself had hired away from PepsiCo a couple of years previously. Jobs did bequeath Apple the Mac, though, but before then the company made a computer which in terms of market share is still one of the most popular ever made.

Jobs could hold an audience in the palm of his hand and sell them his visionary dreams for the future

1977 was the year that made Apple, with the introduction of the Woz-designed Apple II. The II was several evolutionary steps ahead of Apple's original product. It came in a case, for a start, was fully assembled and pretested, had a keyboard and a power supply, stored programs on audiocassette and retailed for $1298. More importantly, it was the first massmarket personal computer with the ability to generate colour graphics. Nothing spectacular, admittedly – a four-colour display with a 280x192 resolution – but at the time it set the market on fire.

The Apple II was an 8bit machine with a MOS 6502 CPU at its heart, clocking in at 1.023MHz. It also had seven expansion sockets to allow customising – and it was a machine that was meant to be customised. Woz and his engineers were all hobbyists and hackers; essentially, they'd designed the machine for themselves.

That did not stop it being a phenomenal success, though. Between 1977 and 1978, Apple's sales increased from $770,000 to $79 million. The II went through many evolutionary changes in its 17-year history and by the time the product line was eventually discontinued in November '93, five million of them had been sold globally.

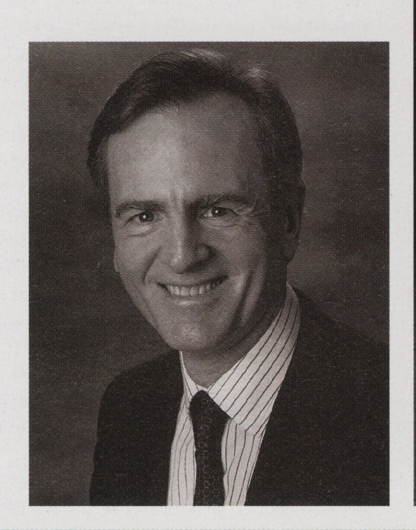
One of the main initial factors for the II's success was the introduction, a year after its launch, of the Disk II. Another Woz-designed product, this 5.25-inch drive and disk operating system was the fastest minifloppy then offered by a computer manufacturer. But more importantly, it transformed the II from a gadget into an appliance. Due to the increased memory available, serious software could now be developed for the system.

One of these packages was *VisiCalc*, a financially oriented spreadsheet program invented by a pair of students at MIT. Launched in 1979, *VisiCalc* was one of the first pieces of software to sell the machine it was running on (about 20% of IIs were bought specifically to run it) and it ushered Apple into the business community, pitting it directly against IBM (or 'The Evil Empire', as Jobs christened it, paraphrasing Reagan).

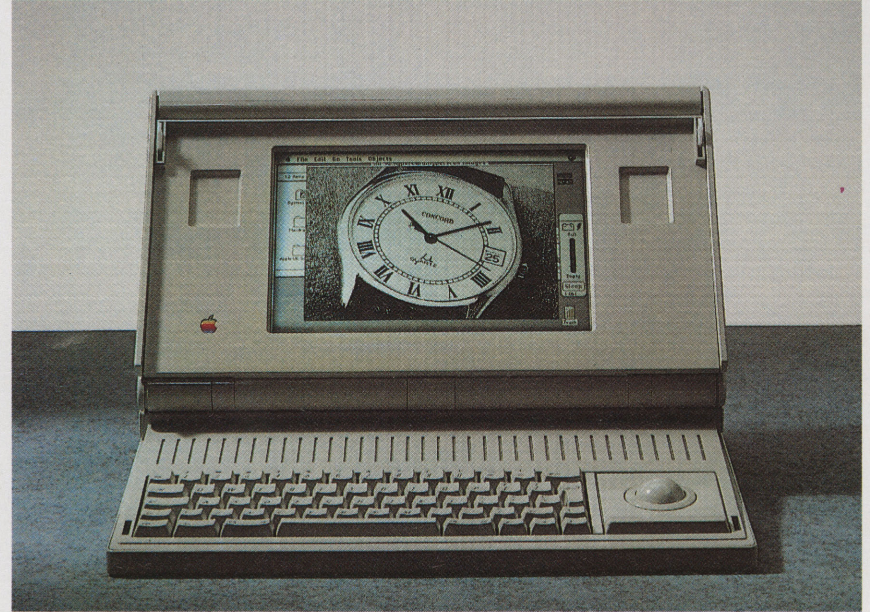
For Apple, in the early 1980s, the II became a licence to print money. And it needed that money after the debacle of the Apple III. The III was a stopgap, first announced as far back as September 1980 when it was hoped that the Macintosh would appear in early 1982. Apple had simply panicked, looked at IBM muscling in on what it considered to be its territory, and rushed out what was basically an ill-conceived and faulty machine.

Continued next page

Apple Computer



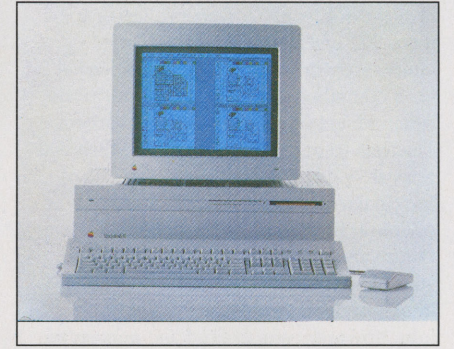






John Sculley (top left), formerly of Pepsi, ousted Apple founder Steve Jobs in 1985. The Mac's ill-fated cousin, Lisa (top right), was the first GUI-based computer aimed at the business community. It flopped. Apple's first attempt at a portable Macintosh (above)





The original Macintosh (middle) is now regarded as a 20th-century design classic; another model, the Mac II (above), wasn't quite as pretty

But despite its faults, it was Apple's most sophisticated computer yet. It had a 6502B CPU running up to a maximum of 1.8MHz and capable of 0.75MIPS; 256K RAM and 4K ROM; and the most advanced OS Apple had yet produced, the Sophisticated Operating System. It didn't have many of its promised features, though, and in a lot of cases it simply didn't work.

The first models off the production line would only run when their cases were unbolted, and when the machine actually hit the market the problems snowballed. The fine-line boards the III used shorted, the clock display crashed regularly, as did the rest of the machine (due to corrosion between the main board and the memory board), there was little software available (and what there was was riddled with bugs), and the manuals were stuffed with errors. The first 14,000 units had to be recalled and replaced.

If the II was the cash cow of the company, the III was simply the cow. Its peak sales were only 4400 a month, and although the problems were sorted out and an improved III+ later released, it never really recovered. It was this that gave IBM the chance to introduce the PC in August 1981 and gain a virtual free run at the market (Apple did virtually nothing until 1983), effectively establishing an image and an installed userbase that Apple would never really be able to break.

The GUI, and Apple's salvation, arrived with Lisa. Lisa and Macintosh were developed in parallel by Apple in an internal atmosphere of bitter rivalry and creeping paranoia. They were different machines aimed at different markets: Lisa was principally aimed at the business community that Apple had hitherto virtually ignored. Eventually, after performing with heroic indifference in the marketplace, it sank, but the GUI and Macintosh lived on.

The concept of a human computer interface had originated with people like Douglas Engelbart and J C R Licklider in the mid-1950s and early 1960s. Engelbart had had the vision of people sitting in front of their own computers and interfacing with them via a cathode-ray tube (very daring in the days of batch-processing mainframes) and Licklider had been put in charge of the Pentagon's Advanced Research Projects Agency in 1962.

ARPA lasted through most of the 1960s and its research programmes had a profound impact on the development of computing. Licklider funded a project at the Massachussetts Institute Of Technology that would allow multiple users to access a mainframe at any give time, Engelbart developed a prototype computer with screen, keyboard and mouse, and researchers at the University Of Utah began work on graphics packages. Come the Vietnam war, though, the idealism that had brought researchers to Washington under the Kennedy administration had all but vanished, and ARPA was forced to work on projects that only had specific military purposes.

About the same time, Xerox decided to move into computer research and built a research centre near the Stanford campus: the Palo Alto Research Center. ARPA research moved almost exclusively to PARC. The first result was the Alto, one of the first computers to be designed for use by a single person. It had a mouse (an adaptation of Engelbart's original design), a high-res screen and a keyboard, and could store 64K of data.

The software was designed by a separate team under Alan Kay. It was Kay who invented the WYSIWYG acronym and his team that developed some of the first icon-driven software. The bitmapped screen the Alto used allowed text and graphics to be combined for the first time and Kay set out to develop programs that would imitate the conventional office desktop onscreen. The Alto gave you windows, italics in documents that actually looked like italics rather than strings of code, and icons representing different functions, all controlled by pointing and clicking with a mouse. When Steve Jobs saw it all, it blew him away.

Xerox had spent more than $100 million in research at PARC and now Jobs walked out with its ideas

Jobs had been permitted into PARC in return for Xerox (which at the time was looking to invest in the burgeoning home computer market) being allowed to buy 100,000 very scarce Apple shares. It was to prove a costly manoeuvre. Xerox had spent $100 million in a decade on research at PARC and now Jobs walked out the door with its ideas and a significant handful of its employees. Apple itself was to spend another $100 million over the next two years developing GUI-based software and although Xerox (belatedly) filed a suit against the company alleging that its copyrights for the Lisa and Macintosh GUIs were invalid, most of its arguments were dismissed by the courts.

Apple has a long tradition of niche marketing dating back to the II, which the company often gave away to educational establishments via a system of grants and programmes. Part of this was pure evangelism, part was sound marketing philosophy, but whichever it was, the Apple Education Foundation established in 1979 has effectively cornered the US education market with a 60% share. On a global scale that share dips to 28%, but education still counts for 20% of net sales.

The Mac has also managed to virtually become the publishing industry standard since its launch, and DTP is credited as being one of the most significant factors in its survival. Figures are slightly more hazy for this sector, but it's estimated that Apple has a 48% share of that industry in the UK. It's a share that is probably going to expand, too, with the introduction of the RISC-based Power Macs, offering faster processing speed which in turn allows much speedier opening, insertion and manipulation of large graphics files. Claims for the increased speed of Power Mac over Pentium can get wildly fanciful, but it seems that it is at least two to three times faster out of the box, with the potential for far greater acceleration.

Indeed, although Apple is planning to expand in many areas over the next few years, the Power Mac is at the core of its plans. Its roots lie in the historic agreement ratified by Apple, IBM and Motorola in October 1991 which not only set the longterm goal of integrating the Mac OS into IBM networks but also laid down the architecture for a new family of RISC processors, the Motorola-manufactured PowerPC chips.

All three companies had good cause to sign the agreement. The incompatibility of Apple's operating system with the PC had resulted in the machine grabbing a meagre 10% of the business market despite its success in a couple of specific sectors. IBM was looking to break the dominance of Microsoft and Motorola was attempting to do the same thing with Intel. RISC, with greatly enhanced performance and far cheaper production costs than the traditional CISC processors (up to 85%

Continued next page

Apple Computer



cheaper, according to some sources), simply seemed to be the logical way forward for all concerned, despite its extreme divergence from Apple's traditional business philosophy.

The first Power Macs based on the Motorola PowerPC 601 chip were launched in March 1994. There were three models (plus complementary AV multimedia variants) available, aggressively priced at roughly the same level as the (then) high-end Mac Quadras. Performance was a marked improvement on the 680x0-series CISC-based Macs, with even the entry-level 6100/60 (clocked at 60MHz) outperforming a comparable Pentium chip with the same clock speed by an average of 24%. When you get to the high-end systems, an 8100/80 outperforms a 100MHz Pentium by an average of 21%.

Sources at Apple suggest that the Power Macs are already 'well on their way' to an installed userbase of one million machines worldwide. And the speed increases provided by the increased amount of native software coming onstream (as opposed to old programs running under emulation) means that number is likely to continue to grow.

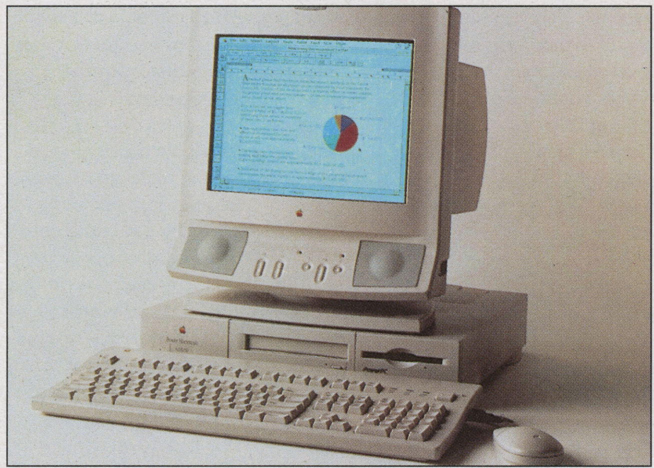
But the 601 is only the first in the series of jointly developed RISC CPUs. Soon the PowerPC 603 will enter the fray. Essentially, this will offer the same performance as the 601, but the differences are in its size (smaller), its power consumption (reduced) and its cost (cheaper). This should make it ideal for a new generation of entry-level Power Macs as well as allowing the portable PowerBook range to upgrade to a RISC architecture – both of which should be happening later this year. Projected after that are the 604 (current forecasts say this is the level at which IBM is planning to enter the market), which should be two to three times faster than the 601, and the 620, four to six times faster and aimed at the high-end workstation/server market.

The PowerPC agreement effectively broke the mould and kicked into touch the last remaining vestiges of the Apple mythology from the days of Jobs and Wozniak. Apple was still a pioneering force, but all traces of the legend of plucky little Silicon Valley startup going head to head with rapacious corporate monster IBM were finally put to rest. Apple was finally sleeping with the enemy.

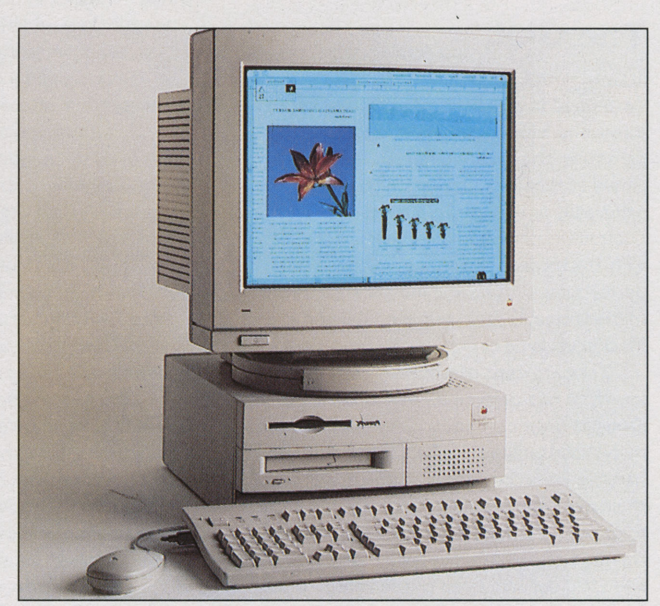
If that was hard for some factions within the organisation to accept – and for an installed base that sometimes seemed more like a fan club (alt.sys.mac.advocacy gives quite a good illustration of that) – the next changes were even worse. Finally, after 10 years of persuasion from customers, industry analysts and people high up in Apple itself, the company announced plans to license the Mac OS.

Clones make such sound economic sense that it's a wonder Apple had retained its OS as proprietary technology for so long. Initially the plan was for the 'Expanded Markets' approach (as the company like to refer to it) to have a very narrow focus. Apple would license the latest version of its OS, *System 7.5*, and elements of its Power Mac architecture only to companies that could bring in benefits Apple couldn't manage itself – in other words companies with certain technical expertise or distribution channels in territories where Apple was severely under-represented. The first Mac clones, made by Power Computing, should be available in the spring, and Bandai's games/multimedia console should be on the shelves by Christmas (see panel). However, that narrow focus has now been expanded.

In November last year, the members of the PowerPC group took the inevitable next step and revealed details of an









So far, Apple has released three basic PowerPC models (clockwise from top left): the 6100/60 (AV multimedia version shown), the 7100/66 and the 8100/80. Non-Apple machines will soon be flaunting the new *Mac OS* logo (left), which will replace the traditional 'happy Mac' startup symbol

agreement to develop a common hardware platform. This had been tried before in 1993 when IBM announced its PowerPC Reference Platform (PReP), which Apple had refused to endorse, but this time all conditions were met. Apple therefore had to pledge open licensing of its OS, including ROM code, to all companies producing for the platform.

The common hardware reference platform promises to be truly revolutionary in roughly the same way the Mac was when it was launched. Possibly even more so, because it effectively removes most of the incompatibility problems that have consistently plagued the computer industry. As well as Apple adapting the next Mac OS (codenamed *Copland*) to the platform, IBM is adapting *AIX* and *OS/2*, Motorola is working on *Windows NT*, Sun Microsystems will port its SPARC program *Solaris* and Novell its network operating system *Processor Independent NetWare*. And *Windows 95* should work too, due to Microsoft's insistence on *NT* compatibility.

The 'vast majority' of Power Mac applications should also run unmodified, while Apple will include full 680x0 emulation in its operating system. Simply choose your desired application, purchase the relevant operating system, reboot and you're away.

The spec is still unfinished but should be finalised in the spring, with developers receiving prototypes in the autumn. Full technical details are therefore not available, but some aspects of the platform are known. Firstly, its core will be a Peripheral Component Interconnect Bus (and Apple's transitional next-gen Power Macs will replace the currently used NuBus with a PCI Bus, leading to a five- to sixfold speed acceleration). It will have SCSI, both the Apple Desktop Bus and PC-style keyboard and mouse connections, and low-level hardware registers that both companies' systems require. Startup and configuration will be handled by OS-neutral code named *Open Firmware*. And it will make provisions for both Mac ROMs and IBM ROM BIOS.

The common hardware platform promises to be truly revolutionary in the same way the Macintosh was

Apple's plans don't stop there, though. The company is still pushing *eWorld*, its attempt to bring a GUI as user-friendly as the Mac's to on-line services. Based on the metaphor of a town square, it has been dismissed by many as far too cutesy (although the Mac's GUI was similarly regarded in some quarters), while the draconian moderation has incensed the anti-censorship components of the on-line community. Nevertheless, it has managed to garner 50,000 paying accounts in its first six months of launch and a recent halving of charges will probably lead to further expansion. Version 1.1 should be released soon, with Internet support and more multimedia capabilities.

Much of Apple's future, though, with the company's survival now seemingly assured, lies with its forthcoming operating systems, *Copland* and *Gershwin*. *Copland* (which will either be named *System 8.0* or *Mac OS 1.0*) was originally scheduled for release in late 1995, although the current rumour is that it has slipped back to early 1996. *Copland* will have far more native code for the 601, 603 and 604 PowerPC processors, as well as an enhanced 680x0 emulator. Information about the actual specs changes with frustrating frequency, but it's probable that it will feature active assistants, pre-emptive multi-tasking and protected memory, plus 64bit addressing, which will allow Macs to access disks containing up to 256 terabytes of data.

After that will come *Gershwin*, details of which are shrouded in even more secrecy. On the agenda, as far as can be made out, is system-level support for 3D graphics, pro-active intelligent agents that actually anticipate user needs, improved speech recognition, on-line navigation and support for multiprocessor machines.

What both will certainly have – and what Apple will emphasise in the face of competition from *Windows 95* – is the new *OpenDoc* software, which Apple claims fundamentally alters the meaning of the term 'document'. It certainly changes the nature of it, leading to the creation of compound documents made up of a collection of 'parts'. A user can call up the functionality of a spreadsheet, word processor or graphics program within a document without having to handle multiple applications. The parts are manipulated by 'part handlers' (*OpenDoc*'s equivalent of applications) which are responsible for the display, editing and storage management of the part.

Whether it will be the transformation that Apple claims is open to question, but it will certainly shake things up a bit and continues the company's long tradition of developing intuitive human interfaces. It's a touch ironic, though, that one of the partners involved in creating the system (in addition to Novell, IBM, Adobe and Lotus) is Xerox.

Power Player

One of the more interesting components of Apple's strategy of expanded markets is its licensing of the 'Pippin' multimedia platform to Bandai. No-one is actually going around calling it a games console yet (the official line is that it's a multimedia player), but it's fair to say that it certainly can fulfil that role.

The Power Player, as it will be called when it is launched, will run a sub-set or runtime version of the Mac OS. Apple is stating that the present Apple CD-ROM catalogue will run with 'minor' modifications while discs produced specifically for Pippin should run on Macs without alteration.

At the system's heart will be the 64bit PowerPC 603 RISC chip, clocked at 66MHz. It will have a quad-speed drive, 6Mb of RAM and 16bit video with VGA, providing a resolution of 640x400 and up to 16.7 million colours. It will also incorporate a composite S-Video output, 16bit dual-stereo CDDA, 16bit digital sampling input and full network support. The retail price is expected to be around $500.

An early prototype model, with keyboard and mouse attached, was on show at Milia '95 in Cannes. Current estimates forecast it shipping before Christmas this year.



Login magazine, ASCII Corp

A REAL ARCADE MACHINE IN YOUR OWN HOME

Choose from the huge range of Jamma Arcade boards available at low, low prices and play them in your own real arcade machine. Why play arcade conversions when you can play the original for less.

JUST LOOK AT THIS SPECIFICATION!



- Robust full size cabinet finished in matt black with real arcade style livery.
- 20" colour monitor for fantastic rgb arcade resolution.
- 8" 10 watt speaker with stylish mesh grill.
- Jamma sound system blasts out arcade game sound.
- Full jamma specificationwith 15 amp switching power supply.
- Super tough 8 way joystick plus 6 chunky microswitched buttons.

REAL ARCADE ACTION

REAL ARCADE MACHINE
£349.99 PLUS CARRIAGE
2 player version available £399

TIMEBASE CORRECTOR

PROFESSIONAL QUALITY

- Composite and Gen Lock input/output. Easy push button video input selector.
- 8 Bit resolution, 4:2:2 sampling. Wide bandwidth freeze frame/field; field 1 and field 2 selectable. Gen-Lock capability.
- Auto-level control fade to black.
- Adjustable control of luma, chroma, brightness and contrast level.

TIME BASE CORRECTOR
£399.99 PLUS £2.00 P&P

VIDEO TO VGA CONVERTER



PROFESSIONAL QUALITY

- Display full screen live video on VGA monitor.
- Input PAL or NTSC and output to VGA monitor.
- High resolution True Colour.
- Switchable between Video and PC VGA input.
- Built in audio & speaker

VIDEO TO VGA CONVERTER
£129.99 PLUS £2.00 P&P

CDM 600 PROFESSIONAL DIGITAL TV SYSTEM CONVERTER

PROFESSIONAL QUALITY

NTSC to PAL — PAL to NTSC
SECAM to PAL — SECAM to NTSC

- Ideal for all applications including dubbing across video standards.
- Digital system means rock steady picture even with VCR to VCR.
- Built-in time base corrector.
- Two inputs and two outputs.
- 525/625 line and 50/60 Hz conversion.
- 2M bit field memory. 500 line resolution.



- CDM 800 Same spec as CDM600 with 4 MEG of field Ram

UNIVERSAL TV CONVERTER

CDM 600	CDM 800
£299.99 PLUS £2.00 P&P	£399.99 PLUS £2.00 P&P

TV SYSTEM CONVERTER

PAL TO NTSC CONVERSION



- Play NTSC equipment on your PAL Monitor/Scart TV.
- Ideal for 3DO, Jaguar, Saturn Playstation etc.
- Converts NTSC video signal to PAL composite Video Signal
- Complete unit supplied with cables etc.

TV SYSTEM CONVERTER
£59.99 INCLUDING P&P

ACTION REPLAY PRO

SUPERNES	£49.99
MEGADRIVE	£49.99
GAMEBOY	£19.99
GAMEGEAR	£24.99
MASTER	£24.99
PC VERSION	£69.99

NOW YOU CAN PLAY REAL ARCADE CLASSICS IN YOUR HOME.

COMPOSITE & RGB VERSIONS AVAILABLE

With this unique arcade power base unit you can play 'Jamma' arcade boards on your own TV.

Choose from the huge range of Jamma Arcade boards available at low, low prices. Why play arcade conversions when you can play the original for less. This full specification unit has all the features required for 'Jamma' Board functions.

Complete with contoller

- 150 watt psu.
- Two joystick ports.
- Full jamma connector.
- Complete with 4 button controller & mains lead
- Full scart output.
- Stylish robust case.
- Credit & reset buttons.

REAL ARCADE ACTION

ARCADE POWERBASE
£99.99 PLUS £2.00 P&P

JAMMA ARCADE BOARDS

We have a full range of genuine Jamma arcade boards including:

SF2, ROBOCOP, CHOPLIFTER, TURTLES, TYPHOON, GALAGA, PITFIGHTER, SIMPSONS, DOUBLEDRAGON, WRESTLE FEST, GOLDEN AXE, SPLATTER HOUSE, ALTERED BEAST GREEN BERET, DYNABLASTER, SALAMANDA, WWF, MIDNIGHT RESISTANCE, FINAL FIGHT.
Plus loads more from only £30.00. Full list available.

JAMMA ARCADE BOARDS
£ Call for latest prices

PRO ARCADE STICK

NEW

THIS GENUINE ARCADE QUALITY JOYSTICK FOR THE ARCADE POWERBASE

- Super tough 8 way Joystick.
- 7 chunky microswitched buttons.
- Ideal for Mortal Kombat or SFII.
- Complete ready to plug in and play.
- Top quality all metal construction.
- Player 1 & player 2 versions available.

PRO ARCADE STICK
£39.99 PLUS £2.00 P&P













NEW

SEGA SATURN

£ Call for latest prices

NTSC TO PAL CONVERTER

- Play SEGA SATURN on your PAL Monitor/Scart TV.
- Converts NTSC video signal to PAL composite Video Signal
- Complete unit supplied with cables etc.

SATURN PAL CONVERTER
£59.99 INCLUDING P&P

MAINS POWER ADAPTOR



- Mains power supply unit for SEGA SATURN™.
- 240 volts input 110volts output @ 15 watts.
- Complete with cable and Saturn connector
- Thermal fuse protection British Made.

SATURN MAINS UNIT
£19.99 INCLUDING P&P

ASK ABOUT S-VIDEO TO SCART CONVERTERS FOR PLAYSTATION & SATURN

SONY PLAYSTATION

£ Call for prices

MAINS ADAPTOR

- Mains power supply unit for PLAYSTATION™
- 240 volts input 110volts output @ 15 watts.
- Thermal fuse protection British Made.
- Complete with Playstation connector

PLAYSTATION MAINS UNIT
£19.99 INCLUDING P&P

NTSC TO PAL CONVERTER

NEW

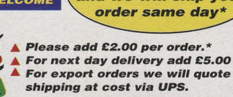
- Play Sony Playstation on your PAL Monitor/Scart TV.
- Converts NTSC video signal to PAL composite Video Signal
- Complete unit with cables etc.

PLAYSTATION PAL CONVERTER
£59.99 INCLUDING P&P

MAINS POWER SUPPLY

Thermal fuse protection British Made.

Mains power supply unit for import equipment such as laser disc players, VCR's, TV's, Consoles etc.



American / Japanese type 2 pin output.

240 volts input 110volts output @ 80 Watts.

NEW

THE POWER STATION
£29.99 INCLUDING P&P

DEALER ORDERS WELCOME

CALL 01782 744707 and we will ship your order same day*

EXPORT ORDERS WELCOME

- Please add £2.00 per order.*
- For next day delivery add £5.00
- For export orders we will quote shipping at cost via UPS.



01782 744707
24hr Mail Order Hotline
FAX 01782 744292

* stock items
* except where inclusive

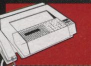
DATEL ELECTRONICS LIMITED



FAX ORDERS
01782 744292
24 HRS SERVICE



TELESALES
01782 744707



FAX ORDERS
01782 744292



ORDER BY POST



CALLERS WELCOME



FAST DELIVERY

SEND CHEQUES, POSTAL ORDERS OR CREDIT CARD DETAILS TO :-



GOVAN ROAD,
FENTON INDUSTRIAL ESTATE,
FENTON, STOKE-ON-TRENT,
ST4 2RS, ENGLAND
01782 744707

Testscreen

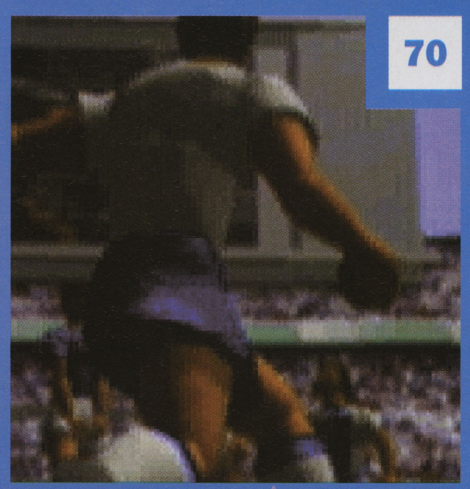
74



78



70

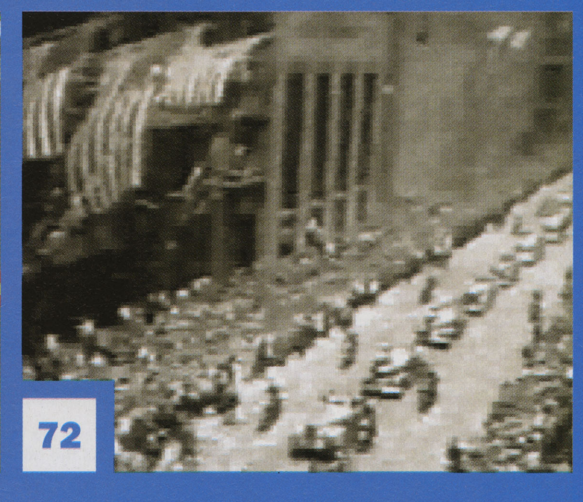


76



68





72

Descent

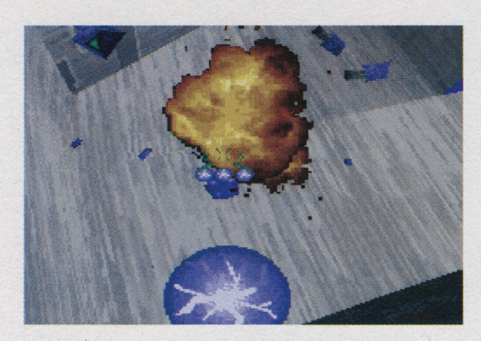


Descent is frantic. You'll find yourself barrel-rolling through weird-shaped tunnels, firing blindly into the distance as the 3D sound thumps into your ears and missiles explode all around you

Turn the detail up to max and you're in for a treat. However, on slower machines the scenery either won't move or will block in irritatingly

Format:	PC
Publisher:	Interplay
Developer:	Parallax
Price:	£50
Release:	Out now

Hard to credit, but it's only two years since *Ultima Underworld 2* was released. At the time, it was one of only two games for the PC that used true 3D movement in a virtual world incorporating physics and complete freedom of movement. Everyone assumed that this was the way forward. Later *Doom* appeared, with its pseudo-3D environment and unfailingly gripping gameplay, and everyone forgot about true 3D. Until *Descent* came along.



The explosions are fully digitised. When your ship blows up, all the power-ups remain in place

Spawned by some of the people who worked on *Underworld 2* at Looking Glass Technology (they subsequently left to set up Parallax Software), *Descent* is an attempt to mix that true 3D world with the excitement of *Doom.* The plot of course, can be disregarded: you play a mercenary employed to flush out a series of mines inhabited by machinery gone haywire. Each mine is a complex series of twisting tunnels and rooms, filled with hostile droids. Your job is to find the central reactor in each, destroy it and then escape before the whole thing goes up. If you can locate and rescue hostages too, so much the better.

Initially *Descent* is a bewildering and wonderful experience. The 3D engine enables you to fly anywhere in space – there's no up and down, no left and right, just confined spaces to move about in, which is deeply confusing until you master the complex





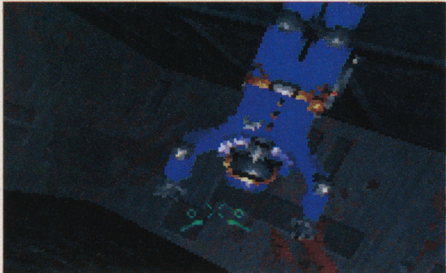
Your ship's cockpit (top). The scenery is extremely varied (above). Launching a missile (top right)



controls. You can spend the first two levels of the game just admiring the flawless, intricately detailed texture mapping (on the assumption you have at least a 66MHz 486DX2 with local bus graphics), the shading effects and the incredible sound, and forget about formulating tactics to fend off the enemy. Then, when you become adept at close-quarters combat and acquire a decent stock of weapons, it might just look like you've stumbled upon the best shoot 'em up – if not the best game – ever.

That's not quite the case. *Descent* is noisy and frenetic and gets the adrenaline pumping to all the right places, and it's certainly learned a lot from *Doom*: there's a four-level shareware version, an incredible multiplayer network mode, a facility to record demos, and legions of other great little touches. Yet something stops it from being a true classic. Maybe it's the awkwardness of the controls (no matter how agile you get, you still occasionally find yourself spinning helplessly in space), or maybe the game is just slightly too repetitive. For example, although the enemies' AI improves radically later on, they still don't do much more than fire and evade.

Descent is streets, if not whole cities, ahead of *Doom* in terms of technology. But people are still playing and enjoying the latter not just because of the underlying ptogramming but because of the ethos, the atmosphere, the attention to detail. *Descent* has this in spades, too. Witness the marvellous countdown sequence when you destroy the reactor – it's straight out of Alien, and guaranteed to induce major panic as you frantically search for the exit. But for all that, this will most probably end up as the sort of game you feast upon for a month and then forget about, only returning to pick at now and again.



The total freedom offered by *Descent* is overwhelming at first. Pick up this chap (above)



Destroy a reactor and locate the level exit to complete each mission (above)

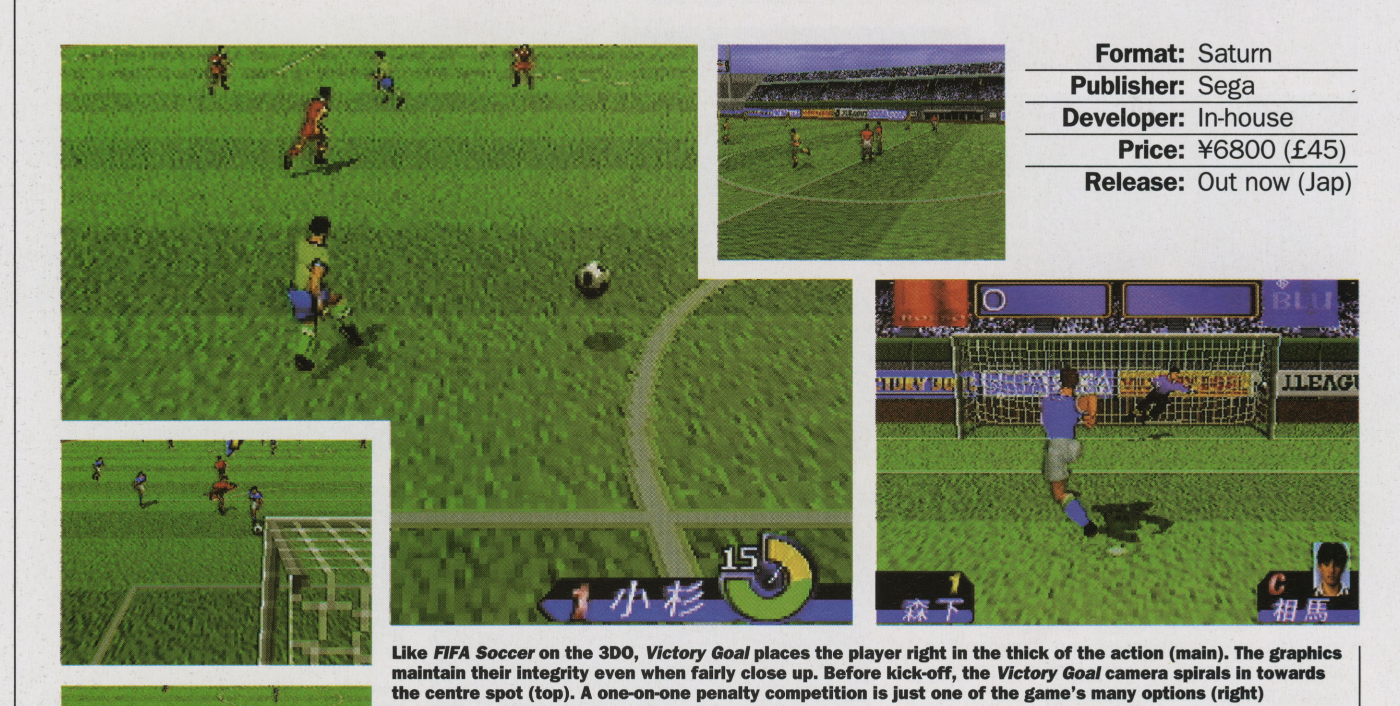
Edge rating: **Eight** out of **ten**



Descent **supports up to eight players over an IPX network. Lie in wait for your friends...**

Victory Goal

Format:	Saturn
Publisher:	Sega
Developer:	In-house
Price:	¥6800 (£45)
Release:	Out now (Jap)



Like *FIFA Soccer* on the 3DO, *Victory Goal* places the player right in the thick of the action (main). The graphics maintain their integrity even when fairly close up. Before kick-off, the *Victory Goal* camera spirals in towards the centre spot (top). A one-on-one penalty competition is just one of the game's many options (right)



There are three main views in *Victory Goal* (top to bottom): close range; middle distance; and the useful aerial vantage point

Sega's *Victory Goal* takes its name from the winning goal scored during extra time in Japanese football matches – no draws are allowed in J-League fixtures.

As with many Japanese soccer sims, the nuances of the sport have been eschewed in favour of instant playability and a meticulous attention to detail. So while you can select any player from any of the real J-League teams, choose from a huge range of competitions, and then pick up and play *Victory Goal* in seconds, real football fans – or anyone familiar with the delights of *Sensible Soccer* – will baulk at the lack of depth in the gameplay.

Oddly evocative of a cross between *Super Soccer* on the SNES and 3DO *FIFA Soccer*, *Victory Goal* has all the graphical pretensions of a 32bit simulation but the shallow mechanics of a 16bit arcade game. Even though there are a number of different kicks to perform (shoot, pass, long lob), the relatively sedate pace at which the action takes place means that the excitement never really reaches fever pitch.

Undoubtedly, this is a soccer game for the Japanese market: their unswerving fanaticism for the J-League is catered for by the wealth of facts, figures and options. A European version of the game would benefit from the inclusion of the stats and strategies of European teams, rather than the likes of S-Pulse and Grampus Eight (although the latter does feature the talents of one Gary Lineker).

Edge rating: **Six** out of **ten**







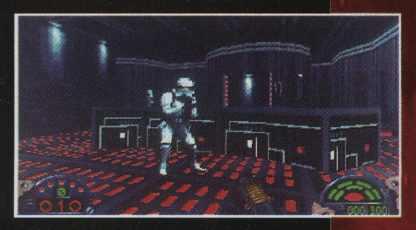


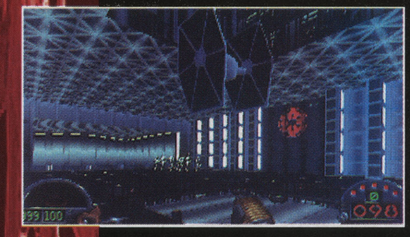
***V-Goal*'s intro is an MTV-style sequence of stills and jump-cuts with a heavy guitar soundtrack**

FROM THE PUBLISHERS OF THE HIGHLY SUCCESSFUL TIE FIGHTER™ AND X WING™ COMES A NEW DIMENSION ON STAR WARS® ENTERTAINMENT

STAR WARS DARK FORCES

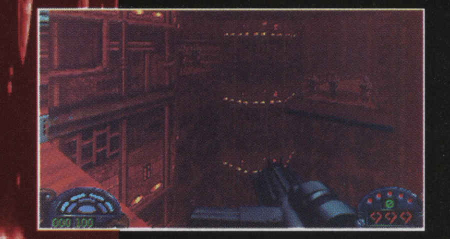
- THE FIRST EVER FIRST PERSON PERSPECTIVE STAR WARS ACTION GAME.





CAN YOU SMELL THE FOUL STENCH OF EVIL?
CAN YOU LOOK DEATH AND DISTRESS IN THE FACE?
ARE YOU READY TO FACE THE DARK SIDE™?



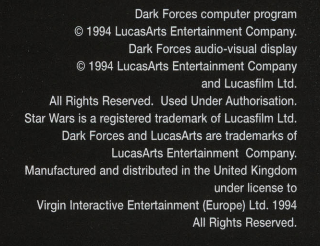


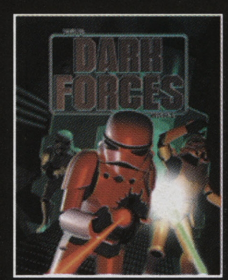
- FIRST PERSON PERSPECTIVE - COMPLETE 360° VIEW AND HEAD-UP DISPLAY
- RICHLY DETAILED 3D ENVIRONMENTS AND OBJECTS
- SELECT 10 WEAPONS TO FIGHT 20 TYPES OF ENEMY





DARK FORCES IS UNDOUBTEDLY THE MOST COMPELLING STAR WARS GAME EVER.

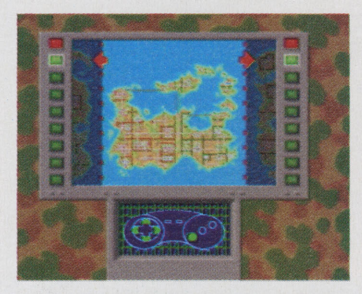






Return Fire

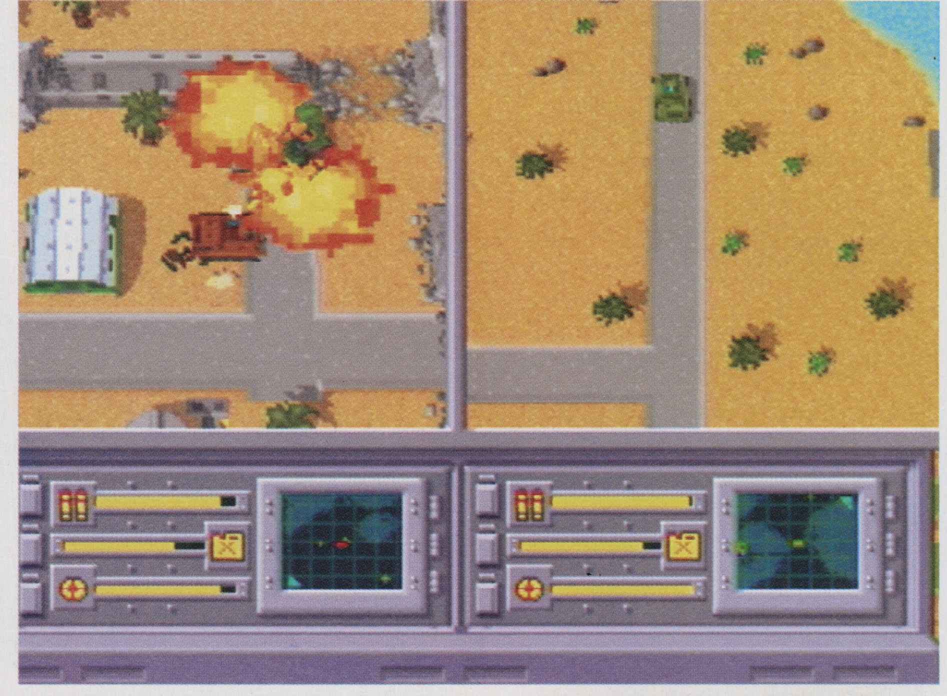
Format:	3DO
Publisher:	Prolific Publishing
Developer:	Silent Software
Price:	£50
Release:	Out now (US)







Select one of the game's 60 or so theatres of war (top). Then choose your mode of transport (middle). The winner of each bout is treated to a ticker-tape parade (bottom)



Explosions (above), accompanied by manic laughter, are one of *Return Fire*'s most spectacular aspects



It's easy to reduce even the most heavily fortified base to rubble in oneplayer mode

After struggling with some unforeseen delays, Silent Software's *Return Fire* has finally made its appearance. And it looks like the wait has been worthwhile.

The game is set on a group of islands off the Australian coast. The aim of each mission is to locate and capture the flag fluttering above your enemy's HQ and return it to your own base. To accomplish this task, you're provided with a limited number of tanks, helicopters, APCs and jeeps.

After *John Madden Football*, *Return Fire* is arguably only the second serious longterm challenge available for two players on the 3DO. Although you can play against the computer, it's the dual-player mode that really makes the game stand out. With two participants, *Return Fire* becomes an exemplary blend of strategy and all-out combat. You have to battle your way through the assorted fixed gun and rocket emplacements defending the enemy base while at the same time keeping an eye on your opponent's progress. There are no 'correct' tactics here; because two humans are involved and each of the 60 well-designed playing maps is different, you have to constantly adapt to changing circumstances.

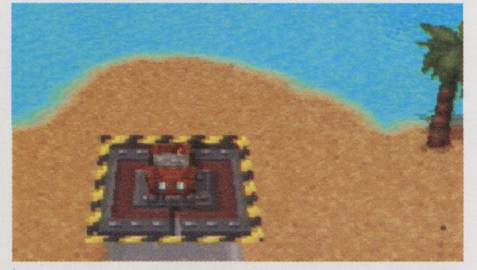
One of the most effective enemy tactics is to lay a proximity mine on a bridge. Your opponent then has the choice of either finding an alternative route (more combat and loss of time) or using the amphibious jeep to cross the river (risky, as the jeep can only withstand

Vehicles









Each of the four vehicles in *Return Fire* has its own unique characteristics (see panel right). There's a finite number of each, so deciding which one to use and when is a crucial strategic decision

Getting **around**

There are four vehicles available in *Return Fire*. To have any hope of completing each mission, you have to use the one that's most appropriate to the circumstances.

Helicopters are vulnerable to enemy fire. They're best used to scout out the flag and for last-minute hit-and-run attacks on your opponent's jeep.

APCs are slow but heavily armoured. They are ideal 'first assault' vehicles as their rockets inflict severe damage. They're also the only vehicles capable of laying mines.

Tanks are more effective in open country than built-up areas. They're tough, relatively fast and can bring down enemy helicopters easily.

The jeep is the only vehicle that can collect the enemy's flag. Very fast, manoeuvrable, and instantly destroyed by enemy flak.

one hit). It's this type of cat-and-mouse gameplay (the bridge is now obviously off-limits for you as well) that makes each game unique.

It's just a shame that the oneplayer mode fails to grip to the same extent. Because the computer doesn't directly attack your headquarters, even the hardest missions lack challenge and are fairly unrewarding. A more rigid structure, a greater number of mines and some enemy tanks patrolling crucial locations would have ensured greater longevity.

The graphics provide a perfect complement to the rich gameplay of the twoplayer mode. Although the bottom third of the screen is taken up with an oversized instrument panel, which means that the playing windows are relatively small, the game still manages to include plenty of detail. Trees toppling over one by one, rockets trailing smoke and little men fleeing from exploding buildings are typical. The camera zooms in and out to allow the player to see the action from the ideal angle – close up for battles, distant when you're travelling fast. The display does jerk occasionally, but this never really becomes irritating.

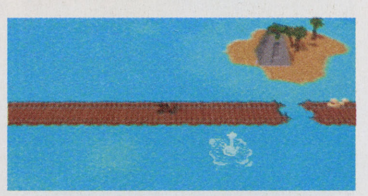
The sound is equally impressive. Rather than plump for the usual synthesised beeps and whistles, Silent has gone for an entirely classical score, overlaid with momentous explosions and presented in sumptuous Dolby Surround sound. The result is reminiscent of the pomp and ceremony of a Soviet-era May Day parade.

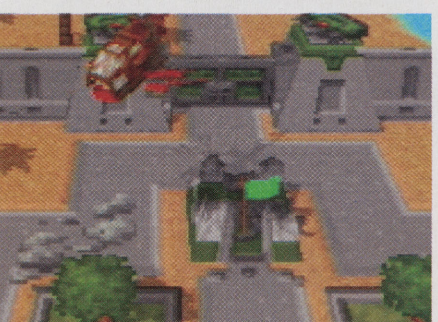
Return Fire is one of the few titles outside the beat 'em up genre to fully exploit the gameplay potential of playing against a human opponent. It's fast, competitive, strategic and, above all, fun. And that's a pretty compelling combination. **E**

Edge rating: **Eight** out of **ten**







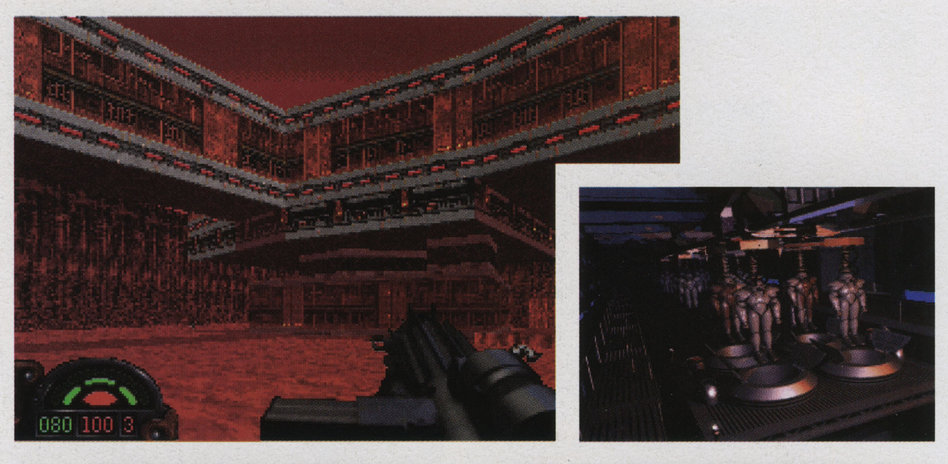




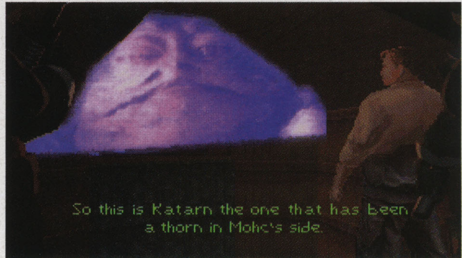
Clockwise from top left: lay mines around the enemy base when you're feeling the pressure; a twin rocket emplacement bites the dust; mining bridges effectively is a tough skill to master; clear all resistance with some heavy firepower before approaching the flag with the jeep; when the flag is discovered, a close-up lets your opponent know all about it

Dark Forces

Format: PC CD-ROM
Publisher: LucasArts
Developer: In-house
Price: £50
Release: March 7







***Dark Forces*' graphics are impressive. This level (top) is probably the most dramatic, as well as one of the most playable. The excellent cut-scenes (above) illustrate the Star Wars story perfectly**





There are plenty of enemies to slaughter in *Dark Forces*, but the excitement of *Doom* is absent

LucasArts knows when it's on to a good thing. And *Star Wars* is without doubt the best thing that has happened to it; the company has made a fortune out of George Lucas' celebrated cinematic trilogy. Now, after a brief excursion in the enemy's hot seat (*TIE Fighter*), the California-based programmers have returned to the Rebel cause for a maze game which they claim offers all the adrenaline of *Doom* plus an enthralling strategy element.

At first you believe them. A brief pre-mission briefing explains your task and then you're plunged into the first level. The playing keys are familiar, the action starts immediately – you're shooting within seconds – and the graphics engine belts along rapidly (although 8Mb of RAM is required).

LucasArts' skill in crafting a storyline can't be faulted. The Star Wars plot – conveyed by means of long and involved cut-scenes – creates a dramatic and plausible atmosphere, with stormtroopers and Imperial guards constantly ambushing you, TIE fighters docking as battle rages around them, and the threat of the mysterious Dark Trooper ever-present.

But then the niggles start to appear. Individually they're insignificant, but cumulatively they spoil the game. Firstly, the jump and crouch keys seem pointless. They're used mostly to hop onto shelves to collect power-ups or to duck through small grates, but why didn't LucasArts simply allow you to reach your hand out and pick objects up, or just make the grates larger? The same is true for the look up and down keys. Many of the levels have obviously been designed with precipitous chasms and vertical cliffs just to make you use these options, but they don't add to the atmosphere. In fact, all both sets of keys do is slow down the gameplay.

The weapons can be annoying, too. Because they protrude into the screen from the side for quite a distance, not only is hitting your target difficult but, unforgiveably, a crucial part of the playing area is obscured, which

A droid bars your progress as lasers shoot across the screen (top left). The hero, Kyle (inset). The monster in Jabba's pit (top right). The Dark Troopers try and stop you in the final stage of your quest (left). The automap is a little on the garish side (right)

means that it's hard to see to the right and down when you're using the bigger weapons (such as the mortar launcher).

Whereas *Doom* had 30 missions of varying size and difficulty, *Dark Forces* has 14 exceptionally difficult ones. And this is its main problem. The first level is just a warm-up, but expect to be well and truly stuck by the fourth or fifth. Vital keys and switches melt invisibly into the walls, stormtroopers regenerate with alarming frequency and shoot you from behind, your own aim has to be ridiculously accurate (there's no margin for error) and ammo is in short supply on the later levels. And the promised strategy element is no more than a token gesture – lugging mines around looking for a ship is hardly a thrilling experience.

Another significant drawback is that there's no multiplayer experience. Presumably LucasArts thought that having hordes of Rebel spies swarming around a star destroyer was taking too much of a liberty with the Star Wars plot, but the rapid growth of networks means that *Doom*, *Heretic*, *Descent* and *Magic Carpet* all have a distinct playability advantage.

Soundwise, *Dark Forces* is accurate but uninspiring. *Doom*'s soundtrack was an essential component of the game, but *Dark Forces*' combination of original Star Wars samples and dramatic laser effects somehow lacks the same intensity.

Ultimately, *Dark Forces* offers nothing that *Doom* didn't provide a year ago apart from pretty Star Wars cut-scenes. Technically it's on a par with the most accomplished 3D games but it fails by trying to add complexity to what is one of the most straightforward game genres. It seems that LucasArts' reputation as a software pioneer has made it wary of producing an instantly playable title.

Dark Forces will be judged by *Doom*'s standards and in every vital area it falls just short. E

Edge rating: **Seven** out of **ten**



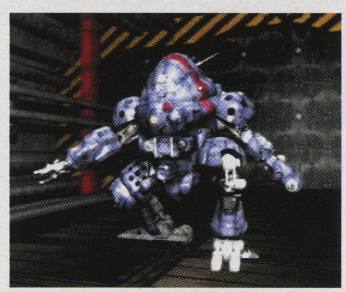
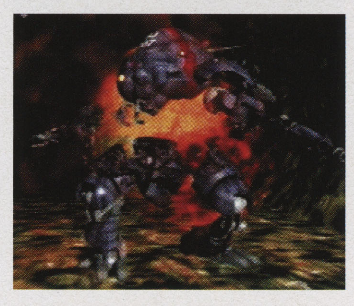
Rather than just swoop along and collect these weapon recharges, as you would in *Doom*, you have to stop, push the crouch and jump keys, and enter the hole

Kileak The Blood

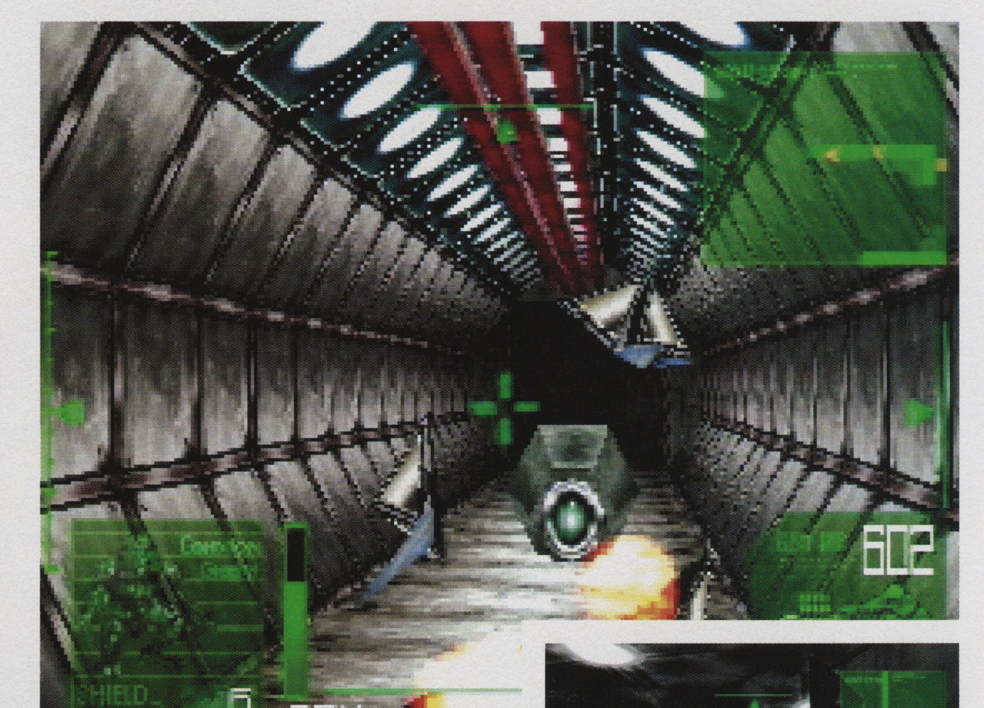
Format: PlayStation
Publisher: Sony Music Entertainment (Japan) Inc
Developer: Genki Co. Ltd
Price: ¥5800 (£37)
Release: Out now (Jap)





The PlayStation's ability to display high-quality, fullscreen FMV sequences is used to the full in *KTB*. The game features an impressive cinematic intro (top, middle), a variety of ingame clips and the inevitable death scene (above)



Although depth cued and elegantly texture mapped, *Kileak*'s rooms and tunnels all exist on one level

Given the current fascination with *Doom*, it comes as no surprise that the first batch of PlayStation software includes a 3D shoot 'em up adventure. But *Kileak The Blood*, which is set within the confines of a claustrophobic underground complex, has more in common with *Wolfenstein 3D* than *Doom*. There are no stairs to climb, no windows to peer through and little in the way of tactical gunplay. When you're faced with a robotic enemy assailant, it's generally a matter of who can let off the most rounds before one of you dies.

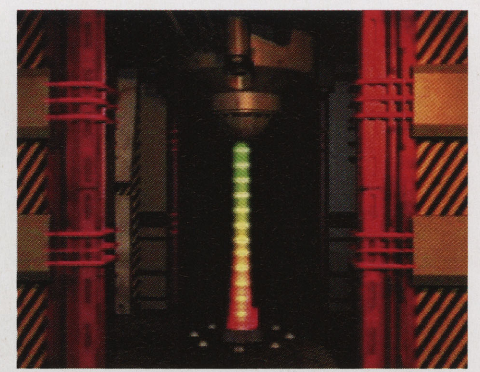
The graphics are, as expected, detailed and convincing. The corridors and rooms move quickly and fluidly, although the texture mapping has a tendency to distort under close scrutiny. Enemies are also fully realised in 3D, which helps to reinforce the realism of the environment, although the result is that there are annoying bouts of slowdown when anything remotely exciting happens.

Unlike the cardboard cut-out creatures of *Doom*, *Kileak* presents real, three-dimensional enemies

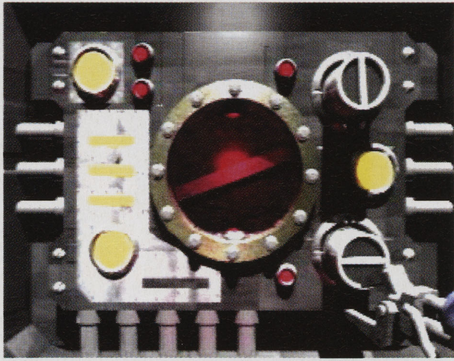
The darkened, depth-cued corridors and moody (if maddeningly repetitive) soundtracks help to create a sinister atmosphere, while an Aliens-style proximity detector and the sudden approach of alien characters does create a mood of genuine suspense. However, like any good film, you need a break from the unrelenting air of impending doom.

A change of scenery would also be welcome. Sadly, the first five levels are all much the same, with similar enemies and a predictable line in metallic decor. Once you reach the sixth level and beyond, the

FMV







Kileak **employs CD-streamed FMV to great effect: an energy plant (top) opens to reveal a colourful robot revitaliser; approach the panel on the wall (bottom) and an over-complex light switch is activated**

Moonbase Alpha look is dispensed with as you travel deep underground, exploring caves and labyrinthine tunnels.

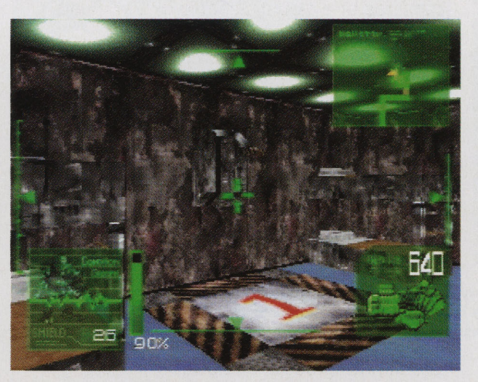
Annoyingly, the rooms often feature interesting-looking devices – boxes, computer banks, items of furniture and so on – the bulk of which you can't interact with. The items that aren't just there to add visual interest merely provide a new FMV sequence rather than any intriguing plot twists.

While the graphics and movie sequences are to be commended, rather less attention has been lavished on the gameplay. *Kileak* simply takes the basic adventure premise of keys and doors, throws in a few very elementary puzzles and adds some shooting action to spice things up a bit. Connecting corridors are long enough to give your task an epic quality, but it basically boils down to finding the exit and shooting anything you meet in the interim.

In fact, the first five levels surrender their secrets relatively easily, and only later does the game begin to become vaguely captivating. *Kileak The Blood* is not without merit, but it's below the PlayStation's abilities in terms of both visuals and playability. Graduates of the PC school of exploration games will find it naive and repetitive.

Edge rating: **Six** out of **ten**



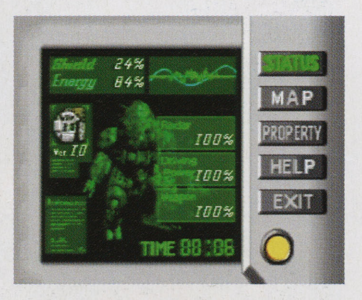


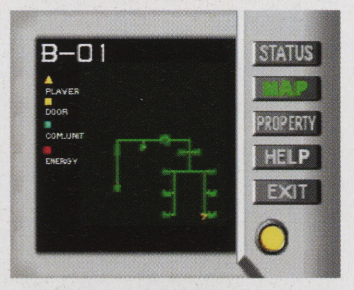
Kileak**'s many rooms are filled with all manner of stuff, including, furniture, computer consoles, cupboards and switches. Unfortunately, most of these items are merely there to pretty things up**

FMV sequences

Kileak The Blood uses streamed FMV sequences to describe certain situations more fully than basic texture-mapped 3D can alone. Specific equipment such as energy plants, communication units and so on can be activated from the joypad. At this point a brief sequence plays to show the device in operation.

While this approach can hardly be termed innovative, the speed and quality of the PlayStation's built-in digital-video playback means that these cinematic clips are a genuine addition to the game, rather than the clumsy and obtrusive efforts which litter PC CD-ROM titles.







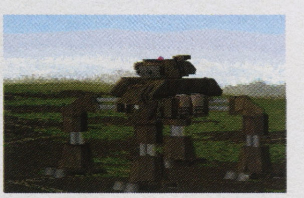
At any time during play you can access a status panel (top), a useful automapping device (middle), and a weapons/inventory screen

Raiden Project

Format:	PlayStation
Publisher:	Seibu Kaihatsu
Developer:	In-house
Price:	¥6800 (£45)
Release:	Out now (Japan)



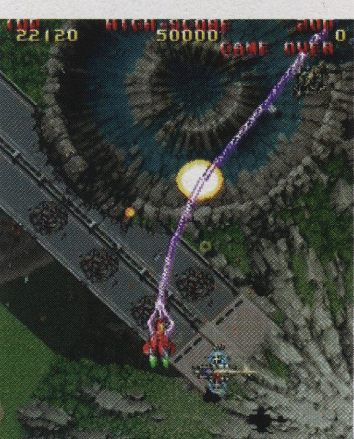






The slightly dodgy intro sequence runs behind the game's title screen





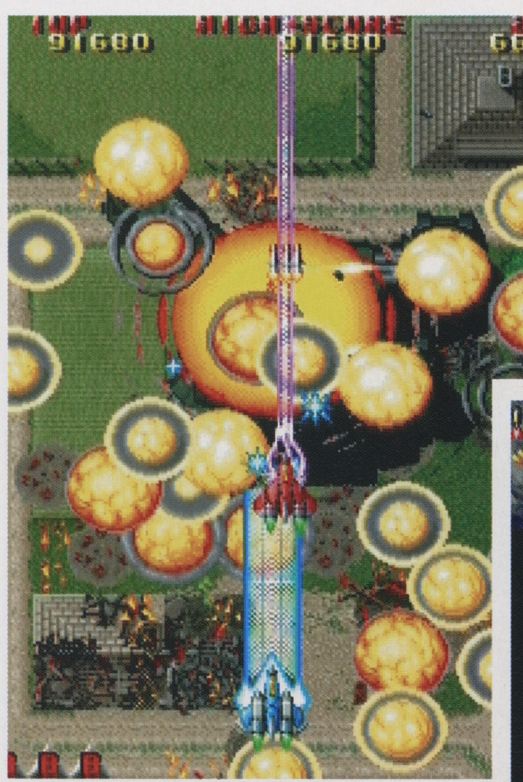


Being a more or less arcade-perfect conversion, *Raiden Project*'s backdrops are faithful to the original (main). The scatter bomb is a devastating form of attack (top left). The purple 'search' and blue 'beam' weapons in action (above left and right)

It seems strange that *Raiden*, in different guises, has been one of the first releases on *two* next-generation machines. The pedestrian Jaguar version was only the third game for that system, and now the PlayStation is playing host to a two-in-one package of Seibu's frantic coin-op less than two months after launch.

It's not as though vertically scrolling shoot 'em ups like *Raiden* are a world-leading genre. Horizontally scrolling blasters such as *R-Type* and the *Gradius* series have always enjoyed fame, while challenging, tightly structured vertical examples such as Toaplan's brilliant *Twin Cobra* (aka *Ultimate Tiger* on the PC Engine) have been left to pick up a more cultish following.

But here *Raiden Project* is, and at first sight it's disappointing. The programmers have taken the rotating polygon spacecraft from the *Raiden II* coin-op's attract mode and developed an entire intro sequence from it.



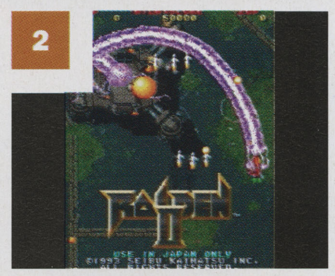


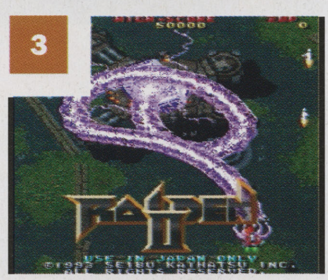
The action slows down slightly with two players, large enemies and enormous explosions onscreen (above). Another type of bomb from *Raiden*'s vast arsenal hits the mark (top right)



The final boss takes an age to overcome. Unlike some of the earlier wondrous enemies, it's disappointingly inanimate – some reward







Raiden Project **offers three types of display. 1 Arcade: a fullscreen mode that requires you to turn your monitor on its side. 2 Normal: a narrowed approximation of the coin-op's screen with borders left and right. 3 Panoramic: this uses exactly the same data as Normal but is stretched to fill the screen. Another novel feature is the ability to readjust the screen window to match your display – just pause the game and use the control pad to shift it around**

Unfortunately, it's embarrassingly shoddy. Things begin to look up when you get to grips with the game's options: the exhaustive selection screen will be appreciated by those who want to fine tune difficulty levels and jiggle around with the display format. And instead of offering a blend of the two coin-ops (as was Seibu's intention when **Edge** first looked at the game in issue 16), the package now includes both coin-ops separately and in their entirety.

The first game, now close to five years old, offers little to anyone but the most nostalgic of arcade connoisseurs. Its gameplay often frustrates, with a typically tough coin-op structure that will win it little favour with 16bit graduates who have long since become accustomed to hard but fair shoot 'em ups.

Raiden II is much more worthwhile, although it too suffers from a difficulty curve geared towards the coin-op market. The graphics – in the Arcade mode at least – are perfectly representative of the coin-op, with spectacular animation and detail. And slowdown only rears its head in ridiculously packed moments.

Both games feature faithful twoplayer modes which, as any *Raiden* veteran will vouch, can prove both an advantage and a hindrance. The presence of two craft onscreen, both heavily powered up, plus the sheer number of enemies and their projectiles, is often overwhelming.

Raiden Project's soundtrack is awful. Although the sound effects are weighty, the chip-played music lacks any appeal whatsoever and does the PlayStation no favours.

Rather than home versions of the coin-ops, *Raiden Project* features, in effect, the *actual* coin-ops. The original, designed for money-gobbling, was tough, but here you've got infinite credits. And that's the main problem. The temptation to notch up credit after credit is irresistible, and the result is that you can breeze through both games in no time.

Raiden Project is a solid indicator of the PlayStation's ability to manipulate sprites and as such will find a welcome home with early adopters eager to see their new baby strutting its stuff in all areas, not just 3D. But with endless credits at your disposal, and some poorly structured action, it's an ultimately shallow experience.

Edge rating: **Six** out of **ten**

Cybersled

Format:	PlayStation
Publisher:	Namco
Developer:	In-house
Price:	¥5800 (£37)
Release :	Out now (Jap)



Some games should definitely stay in the arcades and *Cybersled* is one of them. In oneplayer mode it has acceptable graphics and weak gameplay. In twoplayer mode it has dire graphics and boring gameplay





***Cybersled*'s pre-rendered intro is stylish (top and centre) but slightly grainy. Namco's new twisting 'Negcon' joypad (above) was designed with *Cybersled* in mind**

Namco's superlative PlayStation port of *Ridge Racer* redefined the console driving game. Given the high standard of the conversion, much was expected of *Cybersled*. After all, the original coin-op used Namco's System 21 board – which was about a tenth as powerful as *Ridge Racer*'s System 22 – so surely there would be no problems transferring it? Well...

Cybersled is very straightforward. It's best described as a cross between *Battlezone* and the ancient head-to-head tank games in Atari's 2600 VCS *Combat* cartridge. You pilot a giant futuristic 'battlesled' and enter an arena for a best-of-three shootout with another sled. Your only weapons are a short-range machine gun and a cannon. This simplicity was the game's strength in the arcades: although fairly limited as a oneplayer game, its two-machine link-up made for tense duels.

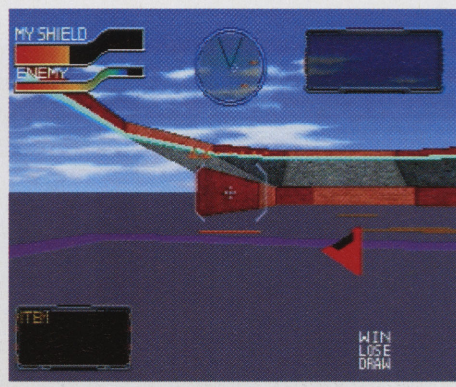
As a oneplayer game, PlayStation *Cybersled* is a relatively faithful conversion. The six characters and their battlesleds – each of which has different ratings for speed, weapons and shields – are all included, and now they're fully texture mapped, as are the eight arenas. Sprinkled around these arenas are various power-ups which restock you with missiles, repair your shields and temporarily jam your opponents' radar and missiles.



Namco's inclusion of the original untextured graphics would have resulted in a smoother ride



None of the arenas has a particularly complex design. Most are laid out symmetrically, but this city arena isn't and is probably the most testing



Cybersled suffers badly from glitches that make whole chunks of polygons disappear (above). They're not so common in the oneplayer game but crop up frequently in splitscreen play

So, all the elements for a no-nonsense shoot 'em up are here. However, the match-ups against the computer feel shallow. They're not so much deadly battles between hunter-killers as games of heavyweight hide 'n' seek. The battlesleds themselves are clumsy to control – you can choose an out-of cockpit view or a behind-the-sled view, but neither is satisfactory. Of course, these faults were present in the coin-op, but they're all the more apparent when you're playing for an extended session on the PlayStation.

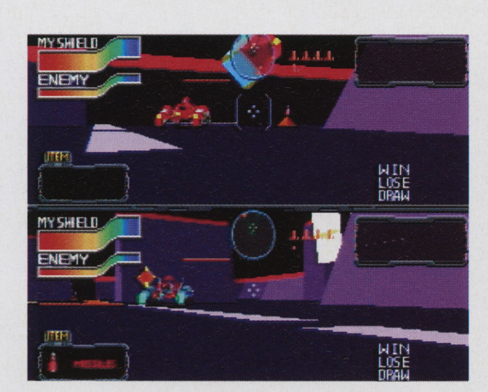
In the arcades *Cybersled* was saved by its twoplayer game, but on the PlayStation there's no two-machine link-up, only a splitscreen mode which reduces the views of both players to a couple of letterboxes. This only makes the handling worse: nine times out of ten the loser is the one who tries a three-point turn and ends up hitting every wall in sight.



Occasionally the action does become exciting but the bouts are too short and too shallow

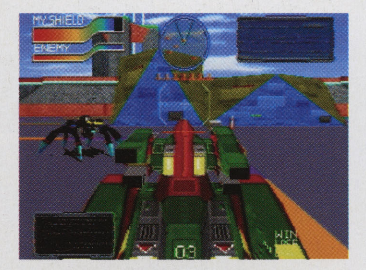
Because of the restricted view and the leaden controls, twoplayer games are typically long-distance affairs – both players hide behind a building, nip out to loose off a missile then scurry back. If the battlesleds run into each other while searching for power-ups, it's the one that gets its guns to bear first that wins, because of their large turning circles.

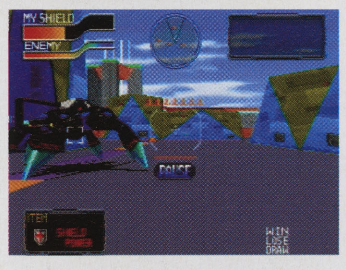
Cybersled was only going to be worth playing if the twoplayer game was up to scratch. However, the splitscreen format compromises the gameplay too much. Arcade games *should* be simple, but they shouldn't be this basic and repetitive. *Cybersled* doesn't do Namco or Sony any favours.

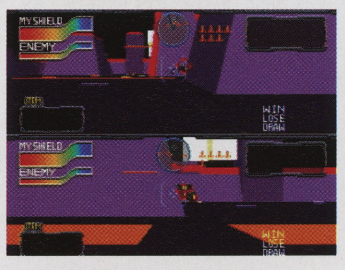


The texture mapping disappears in twoplayer mode but the game screen is still too cramped

Edge rating: **Four out of ten**



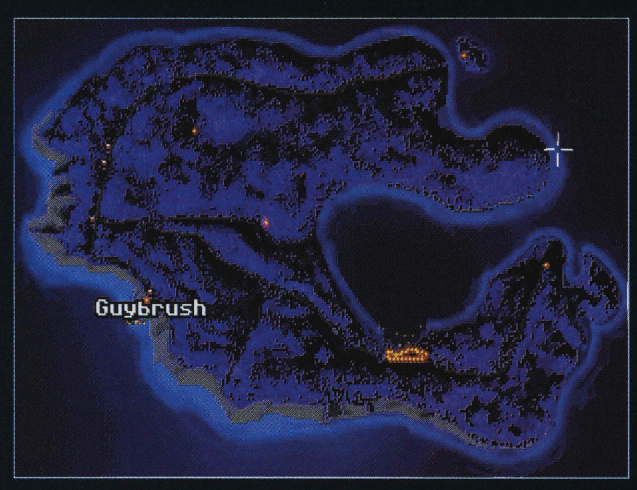




Cybersled gives you two views in the oneplayer game and just one in twoplayer mode. The standard view, from behind and above the battlesled, is the most comfortable. The out-of-cockpit view is lower, slightly narrower and far less playable. There's only the out-of-cockpit view in splitscreen mode, and here the angle is so acute that it's a constant strain to play

In the ephemeral world of videogames, only the very best titles are remembered. This is one game whose fame has not diminished with time

Secret of Monkey Island



Monkey Island. As you advance through the game, various hidden locations are revealed







The pirate committee interviews you for the job (top). The interface made complex actions easy (middle). A duel, not to the death (bottom)

Formats: PC (version shown), Amiga, ST
Publisher: US Gold
Developer: LucasArts
Players: 1
Price: £15-40
Released: 1990

Edge invites contributions to Retroview. Entries must be in Edge style and approximately 250 words long. Published contributions will win a year's subscription to **the magazine.** Address: **Retroview, Edge, 30 Monmouth Street, Bath BA1 2BW.** Fax: 01225 338236. E-mail: edge@futurenet.co.uk.

A humble adventure game could never attract the sort of fanatical following boasted by beat 'em ups and vertical shooters, right? Wrong. This was the first of many preconceptions shattered by the release of *Secret Of Monkey Island* on the PC in 1990. LucasArts simultaneously resuscitated a dying genre and set out on the path to glory it has been treading ever since.

Monkey Island's plot was straightforward but completely absorbing. You play the rather Dickensian-sounding Guybrush Threepwood, whose greatest desire is to become a pirate. However, the beer-swilling renegades whom he approaches aren't prepared to accept just anyone into their elite club. To prove your worth, you have to complete three suitably piratical tasks (all set on the eponymous Monkey Island) and return the spoils to them.

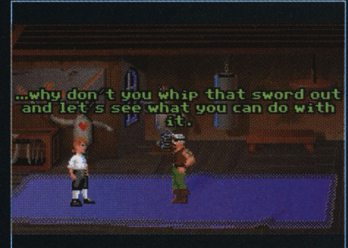
One of the most revolutionary aspects of *Monkey Island* was the fact that you couldn't die. Lots of people baulked at this (where was the challenge?), but there were many other ways in which your quest could be thwarted. Another original concept was the part played by verbal abuse as a complement to the sword-slashing combat. Finding an appropriate retort to an opponent's taunt was great fun.

The visual detail in each location puts many graphical adventure games released today to shame. An exceptionally intuitive interface (a trademark of all LucasArts games), a perfect learning curve and hilarious one-liners all helped make *Monkey Island* arguably the finest example of its genre.



To complete the first mission, you have to follow this shopkeeper to his hideout

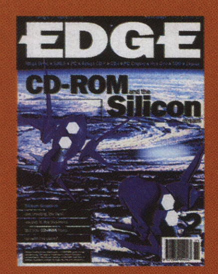


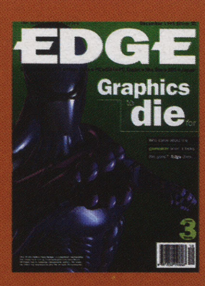


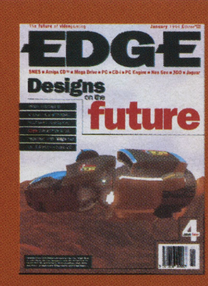
Vanquishing the Sword Master is one of the three quests (top). The only way to meet a puerile double entendre like this (bottom) is with an equally childish response

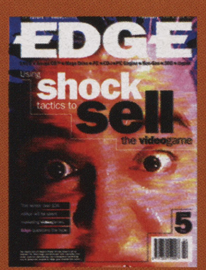
Back issues

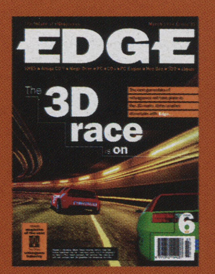
How much did the PlayStation cost to develop? Who was the founder of Namco? What is Taos? The answers to these and many other questions can be found in **Edge** back issues

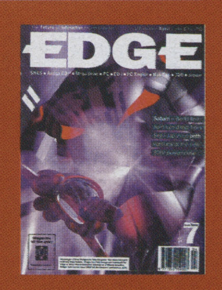


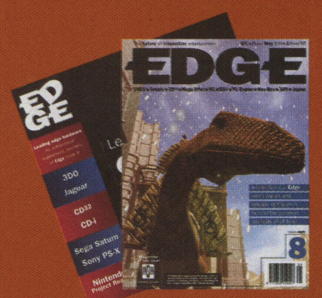


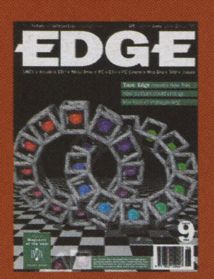


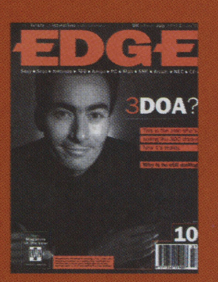


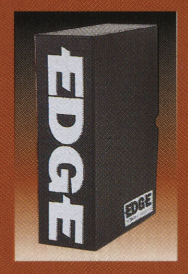








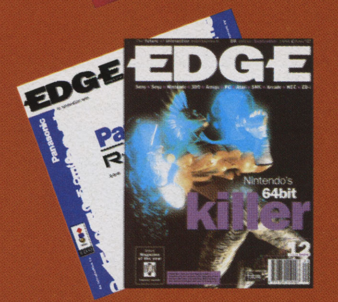


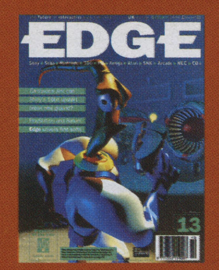


Back issues cost £5 each, or £8 for two (including postage & packing).

The **Edge** slipcase (left) is the ideal way to protect your copies. Each one holds a year's worth of **Edge** and costs just £6.

To order, send the form below, with a cheque/PO made payable to Future Publishing, to: **Edge Back Issues, Future Publishing, FREEPOST BS4900, Somerton, Somerset TA11 6BR.**

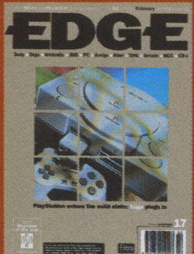




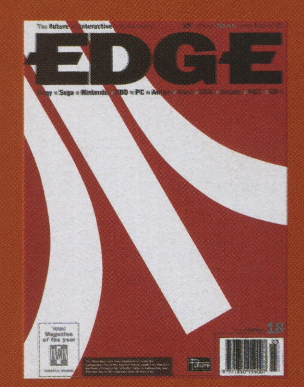








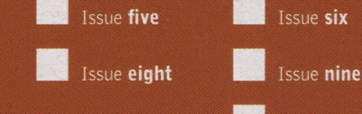




Edge 18
Atari's future is looking brighter. **Edge** charts the rise and fall and rise again of the company that started everything • More power to the **PC**: the PC has changed beyond recognition since IBM launched its groundbreaking machine in 1981. **Edge** reports on its ongoing transformation • Previews: *Flight Unlimited, Terra Nova* (PC); *Metal Jacket* (PlayStation) • **Reviews:** *Toh Shin Den* (PlayStation); *Clockwork Knight* (Saturn); *Motor Toon Grand Prix* (PlayStation)

Back issues coupon

Please send me the following issues of **Edge** (tick as applicable) at £5 each or £8 for two (all orders include postage and packing). EDGB004




(Issue **one** sold out) ☐ Issue **two** ☐ Issue **three**
☐ Issue **four** ☐ Issue **five** ☐ Issue **six**
☐ Issue **seven** ☐ Issue **eight** ☐ Issue **nine**
☐ Issue **ten** (Issue **eleven** sold out) ☐ Issue **twelve**
☐ Issue **thirteen** ☐ Issue **fourteen** ☐ Issue **fifteen**
☐ Issue **sixteen** ☐ Issue **seventeen** ☐ Issue **eighteen**
☐ **Edge** slipcase(s) at £6 each.

I enclose a cheque/postal order (delete as applicable) for £

Name ____________________

Address ____________________

Postcode

Back issues **hotline** number: 01225 822511

We are very **pleased** with the response from **Edge** – the most **successful** and cost-**effective** medium to advertise in

Rob Groves, **Microprose**

EDGE moves...

Rates

Double-page spread	£2400
Full page	£1250
Half page	£650
Quarter page	£350

Contacts

Lydia Milsom recruitment advertising
Dom Beaven advertising manager

01225 442244

30 Monmouth St, Bath, Avon BA1 2BW

Future PUBLISHING

GamesPeople

North and London

Our client is a small and growing division of a multi-national blue chip computer games company. We are looking for the following talented people to work on exciting projects. The vacancies exist in both locations.

2D Artist **£15-25k**
We are looking for realistic atmospheric texture mapping skills for a mean and moody game! Please enclose a demo if possible.

Senior 3D Artist **£25-30k**
Ideally Softimage or other Silicon Graphics skills are required. TV or video experience is welcome.

3D Artist **£15-25k**
3D Studio skills are required for PC CDROM fighter games.

Programmers **£20-30k**
C, C++ and assembler skills are sought. Apple assembler skills are also welcome. Games or multi-media experience is preferable.

Project Manager **£30-35k**
This is an important position. Experience in either software entertainment or multi-media projects is required.

Please contact or send your CV to **Justin Hill** in complete confidence.
GamesPeople
Datascope Recruitment
36 Langham Street
LONDON W1N 5RH

Telephone **071-636 6944**

INTERACTIVE ENTERTAINMENT VACANCIES

Our extensive client base ranges from small software development teams to world leading leisure software publishers, based throughout the UK and Overseas.

The following is indicative of current vacancies, many of which are being managed solely by ourselves:

PROGRAMMERS	**£12K - £38K+**
ANIMATORS/GRAPHIC ARTISTS	**£10K - £30K+**
PROJECT MANAGERS	**c£23K + BONUS + CAR**
PRODUCERS	**£20K - £35K + CAR**

STOP PRESS! - URGENTLY WANTED

3D AND C PROGRAMMERS!
LEAD PROGRAMMERS/PROJECT LEADER!
TECHNICAL AUTHORS!
ALIAS SOFTIMAGE & WAVEFRONT!

Please forward your CV to:
AARDVARK SWIFT CONSULTING (Games Division),
75-77 STATION STREET, SWINTON,
SOUTH YORKSHIRE S64 8PZ

For an update on the very latest opportunities, telephone Stephen Lloyd Davies on
(01709) 571441 Fax (01709) 586527

AARDVARK Swift

Absolute Discretion Assured.
Our service to applicants is free of charge.

CAREER OPPORTUNITIES IN INTERACTIVE ENTERTAINMENT

About us ....
Zodiac Pursuit is one of the leading recruitment consultancies for the leisure software industry

About our clients ....
Quite simply they are Industry's Best!

Locations ....
Positions are available in most geographical areas of the UK. We also have an international division.

Current Platforms ....
Sony PS-X, Ultra 64, Saturn, 3D0, Jaguar, 32X, Sega CD, SNES, CD32 and PC/PC CD-ROM.

Opportunities ....

Senior Programmers — **£30-42k + Bonus**
To lead the development of exciting new projects.

3D Programmers — **£28-37k + Bonus**
A background in 3D graphics programming.

Graphic Artists — **£18-32k + Bonus**
2D and/or 3D skills required.

3D Designers — **£22-35k + Bonus**
Candidates will be familiar with at least one of the following:
3D Studio, Softimage, Alias or Wavefront.

Programmers — **£23-34k + Bonus**
Various projects. 80x86, 68000, ARM, 65816 or C/C++ experience

Animators — **£20-30k + Bonus +P/Share**
2D and 3D animation styles.

Freelancers — **£Negotiable**
Programmers and Artists required.

For more details contact us in complete confidence on: 01924 254467
or alternatively send your CV to Marie Harris at:
Zodiac Pursuit, 16 Colleen Road, Durkar, Wakefield, West Yorkshire WF4 3PX

THE FUTURE IS IN YOUR HANDS!

Talented individuals are needed for our clients in the UK and abroad for the creation of next generation software on leading edge platforms (Saturn, Playstation, PS-X, 3DO, Ultra 64, SNES, Megadrive, PC, CD-ROM).

The following are typical of current vacancies:-

- **South East/Midlands/California** — upto £35K
  PC Programmer ('C', 8086, Track Record Adv.)
- **North West/California** — upto £28K
  Programmer (3D 'C', C++, Games Experience Adv.)
- **South East/South Central** — upto £22K
  Apple Mac Programmer (3D 'C', DOS, Windows)
- **South East/Midlands** — upto £25K
  Graphic Artists (PC - 3D Studio, Silicon Graphics - Alias/Softimage/Wavefront)
- **North East/California** — upto £24K
  Graphic Artists (3D Studio, Steam/Light Flare)
- **South East/South Central** — upto £35K
  Producers/Ass. Producers (Previous Games Experience, & Track Record preferred).
- **North West** — upto £20K
  Software Engineers x 10 ('C', Assembler Adv.)
- **North West** — upto £20K
  Multi-media Programmer ('C', Windows Adv.)

TPA Leisure

URGENTLY REQUIRED WORLDWIDE!
3D 'C' PROGRAMMERS
(Past Games Experience)
SNES/MEGADRIVE PROGRAMMERS
LEAD GRAPHIC ARTISTS/
ANIMATORS (Track Record)

For further details on these opportunities and more call John Morris or Mark Battersby on 01260 299945 (Office Hours and 24 Hour Answerphone).
Alternatively send a CV and any examples of work to TPA Leisure, 75 Manchester Road, Congleton, Cheshire, CW12 2HT (24 Hour Fax: 01260 299946).

Computer Graphics Artists

NEW JOB IN THE LEGO GROUP

LEGO Futura ApS is looking for experienced freelance computer graphics artists. You will work with a small team of highly creative software designers developing new and exiting LEGO Dacta software products for the educational market.

Qualifications:
You should posses strong skills in at least one of the following: 2D drawing/visualisation, 2D animation, Interface design (buttons, icons, etc.), Colouring/Retouching of scanned drawings, Image processing, 3D modelling and animation.

Applicants should have proven experience in the games or multimedia business. Emphasis will be placed on strong visualisation skills and the ability to cover multiple graphical styles. A solid knowledge of the Mac and/or PC platforms is an advantage.

Application:
Send application and samples of your work (paper, video or disk) to
LEGO Futura ApS
PU4. afd. 183
Attention Bjarne Tveskov
7190 Billund
Denmark.
The materials will not be returned.

The LEGO Group
Purveyor of creative experiences, play and educational materials for children all over the world. Approx 8,500 employees in six continents – of this 4,100 in Denmark

LEGO®

GamesPeople

Career Opportunities

3D Programmers £20 - 35k, London	Large company, Playstation development in C.
3D Programmers £20 - 30k, Oxon	Large company, 3D0, Saturn, Playstation, SNES, Megadrive.
PC Programmers £18k/25k/30k South	C++, Windows, 8086. CD-Rom & Video if possible.
Artists £15-25k London	3D Studio Skills for PC CD-Rom games.
Programmers/Artists c£20k, S. Coast	PC and CD-Rom programmers/ 3D Studio and Wavefront artists.
Graphic Artists £15 - £35k, London	Softimage experience for Playstation development.
Producer to £40k, London	International games company seeks senior manager.
CANADA $ High	Opportunities for Producers and 3D programmers - Playstation, Saturn and Ultra 64.

Please contact on **Justin Hill** in complete confidence. **071-636 6944**

or send your CV to **Games**People Recruitment
36 Langham Street
LONDON W1N 5RH

Telephone **071-636 6944**



Rare is one of the worlds leading developers in the video game industry, with over ten years in the business (originally as Ultimate Play The Game), we have developed many revolutionary new products.
Donkey Kong Country & Killer Instinct are just two examples of our future releases which demonstrate our experience in gameplay combined with stunning visuals created on the latest Silicon Graphics hardware and Alias software.
Our world class development studios are located in rural Warwickshire, offering the best working environment to creative and talented employees working on various platforms including Nintendo's new Ultra 64.

SOFTWARE ENGINEERS - Required to code advanced software using S.G Indy workstations and P.C's. Applications must be fluent in c or Assembler. Experience in the games industry an advantage.

3D COMPUTER ARTISTS - Good all round ability at modelling, animating & designing characters & environments. Successful candidates will use Alias software on Silicon Graphics workstations.

GAME DESIGNERS - Excellent knowledge of games over various formats and ability to communicate ideas clearly on paper & verbally. Previous experience advantageous.

SYSTEM MANAGER - With the vision and talent to run our growing, state of the art SGI network. UNIX experience essential, SGI experience advantageous.

DOCUMENT / STORY WRITER - Highly versatile individual required to utilise their skills from writing imaginative storylines to creating publicity documents. Work examples required.

FIGHTING GAMES FANATICS - Are you obsessed by fighting games? Do you have what it takes to be the next Streetfighter or Mortal Kombat champion? If so tell us which you think is the best fighting game & why. Must be 16+ to take up full time in house position.

All C.V's & work examples to:
(Rare does not use employment agencies.
If sending disks please make
sure they are auto-booting).

Personnel Dept.
Rare Ltd.
Manor Farmhouse
Church Street
Twycross
Warks
CV9 3PJ





Talented people

BINARY ASYLUM IS A SUCCESSFUL AND GROWING SOFTWARE HOUSE (DEVELOPERS AND PUBLISHERS OF THE AMIGA HIT ZEEWOLF) AND IS LOOKING TO RECRUIT THESE TALENTED PEOPLE TO HELP US REALISE OUR AMBITIONS:

PC PROGRAMMER
An experienced 80 x 86 assembly language programmer, with a thorough understanding of PC hardware, is required. Knowledge of C/C++ and/or 68000 would be useful but is not essential.

68000 PROGRAMMER
An experienced 68000, familiar with either the Amiga, Megadrive or Apple Mac is required.

C/C++ PROGRAMMER
An experienced C/C++ programmer, with a thorough understanding of the PC's is required.

GRAPHIC ARTIST
An experienced bit-map artist is required. Applicants must have the capability to produce high quality work within the limitations imposed by hardware requirements. 3D rendering/animation package experience would be advantageous.

Applicants for all of the above posts must have previous game development experience (i.e. at least one published title to their name). All applications treated in strictest confidence.

If you reckon you're just the person for one of the above positions, all of which have a competitive salary, send a cv in the first instance to:

The Development Manager, Binary Asylum,
28 Brock Street, Bath, Avon BA1 2LN





Do You have the talent and ability to make ideas happen?

Iguana Entertainment, one of the industry's top developers and the force behind hits like "NBA Jam" & "NFL Quarterback Club", seeks professionals to join our ever growing development staff. Current platforms include Nintendo Super NES, SEGA Genesis, Saturn, 32X, Sega CD, and Sony PSX. A few of our upcoming products are: Aero the Acro-Bat 2, Zero the Kamikaze Squirrel, NFL Quarterback Club 2, NBA Jam Tournament Edition, and Batman 3.

VIDEO GAME ARTISTS, ANIMATORS, 3D ARTISTS, DESIGNERS & PROGRAMMERS

ARTISTS:

Successful candidates will have experience in computer based graphics, animation, and familiar with DPaint, 3D Studio, Autodesk AnimatorPro, and conventional illustration.

ANIMATORS:

Cartoon animators with a traditional cel background in the TV or film industry are needed. To qualify, applicants must be skilled in a variety of styles, such as realistic, cartoon, and effects.

DESIGNERS:

Seeking highly creative candidates obsessed with video games. Must be motivated team players capable of turning abstract ideas into graphic images and creative game designs. Requires strong written and verbal communication skills. Previous experience within the industry is a plus. A college degree is preferred.

TECHNOLOGY/TOOLS PROGRAMMERS:

Must be fluent in "C", 486 Assembler, SVGA Video Cards and User Interface Design. Ideal candidates will also possess experience in Video Compression, Real Time Rendering Techniques and have a strong math background.

3D ARTISTS:

Our Advanced Technology Department is looking for experienced 3D artists with the following qualifications:

- *Strong character animation and art experience (College and/or production job)*
- *Strong design skills in both character design and structures*
- *Experience in the games industry is a plus*
- *Well rounded 3D artist capable of modeling, animating, creating texture maps, and lighting*
- *Experience with IBM and SGI machines*
- *Have experience with some or all of the following packages:*
  - *Alias Power Animator*
  - *Wavefront*
  - *3D Studio*
  - *Photoshop*
  - *Fractal Design Painter*
  - *Autodesk AnimatorPro*
  - *Deluxe Paint Animation*

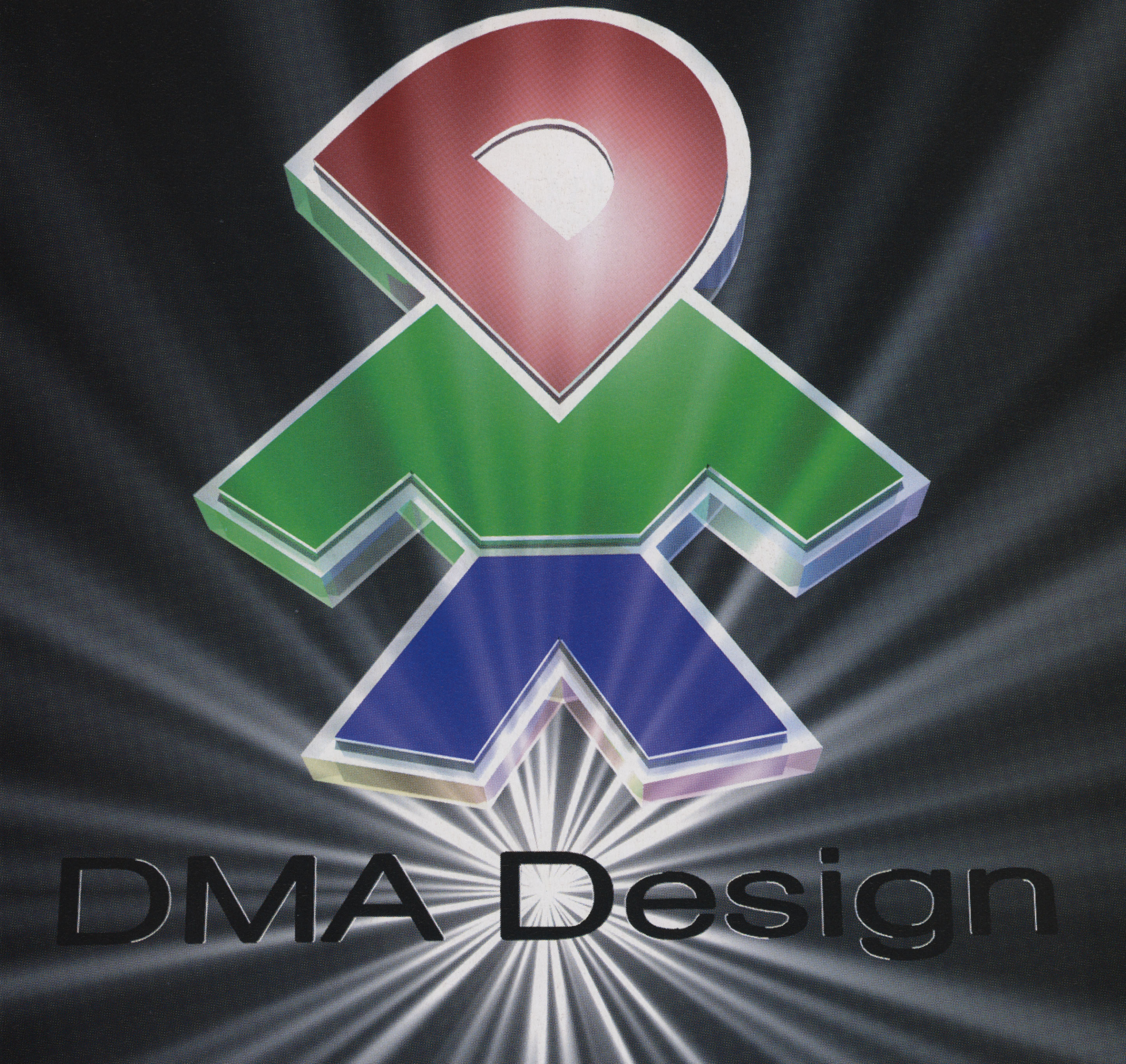
GAME PROGRAMMERS:

Must possess strong "C" and problem solving skills along with experience in: 80x86, 68000, 6502, RISC, 2D or 3D Graphics techniques. Previous game development experience or a college degree is required.

We offer an excellent compensation and benefits package, an exciting and challenging work environment, committed and dedicated teams, a proven track record and high profile projects. To be considered for any of the positions listed above, you must send work samples with your resumé to:

IGUANA ENTERTAINMENT, LTD.
Personnel Dept. E.
Church House, Grange Road
Middlesbrough, Cleveland, TS1 2LR England

IGUANA ENTERTAINMENT, INC.
Personnel Dept. E
3410 Far West Blvd., Suite 301
Austin, TX 78731 USA


DMA Design

WE´RE LOOKING FOR THE RIGHT PEOPLE TO CREATE

MAGIC...

3D MODELLERS
ANIMATORS
GRAPHIC ARTISTS
GAME DESIGNERS
PRODUCERS
PROGRAMMERS

PLEASE SUBMIT A WRITTEN APPLICATION WITH SAMPLES OF EARLIER WORK TO:



FUNCOM A/S
LANGKAIA 1
N-0150 OSLO
NORWAY

TELEPHONE: +47 224 20102, FAX: +47 224 20302

FUNCOM HAS BEEN ESTABLISHED AS A MAJOR PLAYER IN THE MARKET. OVER THE PAST YEAR WE HAVE GROWN TO 65 PEOPLE IN OUR OSLO FACILITIES. WE DEVELOP ON ALL EXISTING HARDWARE PLATFORMS INCLUDING COIN-OP. WE ARE EXPANDING INTO EUROPE WITH BRANCHES IN SOUTHERN FRANCE AND IRELAND.





Interested in sport? Have a million and one ideas for a 'sports simulation'? Want the opportunity to **design**, **create** and **program** the best sport sim around, using advanced 3D techniques on leading edge platforms (PlayStation, Pentium, etc.)?

If this is you , then send in your C.V. and convince us you can do it!

MotiveTime Limited
ANCHOR HOUSE
ANCHOR ROAD, ALDRIDGE
WALSALL, WEST MIDLANDS
ENGLAND WS9 8PW
Fax 01922 743029
Internet stevewilcox @delphi.com

Applications by post,fax or e-mail only
DO NOT PHONE

No Agencies

An associate company of Elite Systems Limited

Production Director £negotiable

A unique opportunity to move into an executive position and help determine the direction of a major new force in entertainment, with the opportunity to acquire equity. At least five years' production experience with programming background required.

R&D Systems Designer £24-30k
Get out of the code jungle and use your programming experience and graduate qualifications to design the systems behind tomorrow's worlds. Creative flair and a fascination with the hidden logic of human, narrative and environmental systems are essential.

Programmer £20-24k
2+ years working on PC titles for a recognised company (a relevant degree could compensate for less experience). Console programming experience an advantage. C++ and assembler skills required.

Games Designers £15-18k
You need technical awareness combined with a passion for games, literacy, and the creative drive to realise your ideas.

Myelin carries out research and development (for both on-line and off-line products) for some of the biggest names in entertainment. All positions reward enthusiasm for and experience of games software with clear career opportunities within a superb working environment just minutes from Covent Garden.

This is a unique opportunity to join a major development house at the beginning of its career, with the chance to share in the long-term success of the company.



Reply to: Sally Agarwal, Myelin,
Brettenham House, Lancaster Place, London WC2E 7TL

Multimedia Programmers
Artists/Animators
Multimedia Designers

Team 17 Software Ltd
Longlands House
Wakefield Road
Ossett
West Yorkshire
WF5 9JS



Team 17 are looking for Programmers and Artists/Designers to create interactive documentation for our best selling games products. The successful programming applicants will be experienced C/C++ programmers familiar with programming applications for Windows/MacOS and with an interest or experience in multimedia development. The artists will be either traditional computer animators or graphic/multimedia designers comfortable with working for on-screen output.

In return for working in our spacious new West Yorkshire office building we offer a competitive salary, a friendly and creative working environment and the opportunity to progress within a fast growing company.

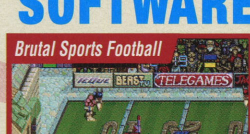
Please send up to date resumés, complete with current salary, to: **Marcus Dyson** at the above address, or email to both
marcus@badmoon.demon.co.uk
and
doctor@team17.demon.co.uk

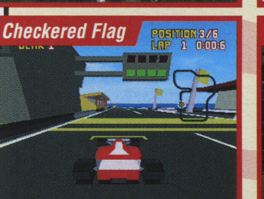


THE FUTURE STARTS WITH JAGUAR

THE WORLD'S ONLY 64-BIT CONSOLE

AWESOME SOFTWARE





Dragon - Bruce Lee Story



Alien v Predator - JGS 1122	NOW	£54
Brutal Sports Football - JGS 1532	NOW	£49
Bubsy the Bobcat - JGS 1581	NOW	£39
Chequered Flag - JGS 1761	NOW	£54
Club Drive - JGS 1794	NOW	£49
Crescent Galaxy - JGS 1852	NOW	£39
Doom - Special Edition JGS 2282	NOW	£54
Dragon - Bruce Lee Story - JGS 2272	NOW	£49
Evolution - Dino Dudes - JGS 2462	NOW	£39
Iron Soldier - JGS 4011	NOW	£49
Kasumi Ninja - JGS 4502	NOW	£54
Raiden - JGS 6722	NOW	£34
Tempest 2000 - JGS 7472	NOW	£49
Wolfenstein 3D - JGS 8932	NOW	£49
Zool 2 - JGS 9312	NOW	£39
Syndicate - JGS 7301	FEB '95	£49
Cannon Fodder - JGS1704	FEB '95	£44
Creature Shock - JCD 2341	FEB '95	£39
Demolition Man - JGS 2142	FEB '95	£39
Flashback - JGS 2971	FEB '95	TBC
Rise of the Robots - JGS 6942	FEB '95	£49
Sensible Soccer - JGS 7011	FEB '95	TBC
Theme Park - JGS 7501	MAR '95	£49
Troy Aikman Football - JGS 7831	MAR '95	TBC
Charles Barkley Basketball - JGS 1741	APR '95	TBC
Rayman - JGS 6891	JUN '95	TBC
PowerDrive - JGS 6521	JUN '95	TBC
Battlemorph - JCD 1201	EARLY '95	TBC
Blue Lightning - JCD 1531	EARLY '95	TBC
Hardball III - JGS 3841	EARLY '95	TBC
Hoverstrike - JGS 1341	EARLY '95	TBC
Legions of the Undead - JGS 4941	EARLY '95	TBC
Pinball Fantasies - JGS 5931	EARLY '95	£44
Space Wars 2000 - JGS 7031	EARLY '95	£49
Star Raiders 2000 - JGS 7192	EARLY '95	£49
Tiny Toon Adventures - JGS 7592	EARLY '95	£49

ACCESSORIES

Composite Monitor Cable - JGA 4327		£16.99
Jaguar Controller - JGA 2000		£19.99
RF Switch Box inc Cable - JGA 4871		£16.99
Scart Cable - JGA 4200		£9.99
CD-ROM Add-On - JAG 1164	MAR '95	£149
FMV Module	APR '95	£199
VR Headset	LATE '95	TBC

All Prices include VAT

- ***SUPER CONSOLE! AHEAD OF THE PACK***
  Atari's Jaguar offers more power than any other system. It is totally futureproof with the power of virtual reality and remote gameplay via modem expected during next year.
- ***PLAY FROM ANY VIEW***
  Change play perspective. View gaming areas from above, left, right, behind or in front.
- ***ZOOM IN FOR CLOSE UP ACTION***
  Jaguar allows you to zoom in on any part of a game's play area.
- ***SAVE STATE OF PLAY***
  Store those high score tables and game positions in special random access memory stored on the cartridge.

EXPECTED DURING '95

- ***LINK UP WITH 'CATBOX'***
  The optional extra Catbox plugs into the back of your Jaguar, enabling you to connect a wide variety of add-ons simultaneously. Facilities include the ability to link up to 32 Jaguars together for multi-player games such as Doom and Club Drive.
- ***CD-ROM FILMS & UNBELIEVABLE GAMES***
  Tap the power and speed of CD-ROM with Atari's Jaguar add-on (expected Feb '95). Play bigger 3D games, standard audio CDs and films (with optional extra FMV module - expected Apr '95). The CD-ROM drive also includes a virtual light system, which creates an interactive light show in time with CD audio output.
- ***VIRTUAL REALITY'S COMING***
  Watch spaceships whirl around your head, laser bolts slice past you, sounds of destruction fill your head as you become part of the game. Jaguar's virtual reality helmet is expected in 1995.
- ***CONNECT WITH A WORLD-WIDE NETWORK***
  In the world of Jaguar, distance means nothing. Play against Jaguar owners in New York, France, Greenland or even Australia. Plug in your optional virtual reality helmet, and do battle in cyberspace with players from around the world.

- 64-BIT DATA BUS
- 5 Processors
- 2Mb 32-BIT RAM
- Spectacular 32-BIT Graphics
- Unique 360° Gameplay
- 3D Game Worlds with No Restrictions
- 16.7 Million Colours
- CD Quality Stereo Sound
- 17 Button Controller
- Plugs Straight into a TV
- Free Cybermorph Game
  On Cartridge - Worth £39 INC VAT

COMING IN '95

VIRTUAL REALITY
EXPECTED LATE '95

CD-ROM ADD-ON
EXPECTED FEB '95

PLUS! WATCH FILMS
WITH OPTIONAL FMV MODULE - EXPECTED APR 95

ATARI
JAGUAR OFFICIAL UK PRODUCT
JAGUAR™
64-BIT

FREE! - CYBERMORPH WORTH £39

SAVE £30
OFF RRP OF £229.99

JAGUAR CONSOLE + CONTROLLER PLUS CYBERMORPH GAME

£199

INCLUDING VAT - JAG 1064

FREE DELIVERY IN UK MAINLAND

THE SILICA SERVICE

SILICA 1978 1995 17 YEARS SERVICE TO YOU

Before you decide WHEN to buy, we suggest you consider WHERE to buy and protect your investment with a purchase from Silica. With our unrivalled experience and expertise, we will provide all the extra help, advice and new product information you may need both now and in the future. Visit one of our stores, or return this coupon now and begin to experience the "Silica Service".



NOW IN 18 BRANCHES OF



STORES NATIONWIDE

SILICA IS A DIVISION OF PRODIS PLC 15500112-4

- ***ESTABLISHED 17 YEARS:***
  We have a proven track record in professional computer sales.
- ***PART OF A £50M A YEAR COMPANY:***
  With over 300 staff - We are solid and reliable.
- ***EXPERIENCED STAFF:***
  All fully trained in 'Customer Care'.
- ***TECHNICAL SUPPORT HELPLINE:***
  FREE help and advice from a team of experts.
- ***A FULL PRODUCT RANGE:***
  All of your computer requirements from one supplier.
- ***WE PRICE MATCH:***
  We will normally price match any local high street store within a 3 mile radius on a "Same Product - Same Price" basis.
- ***FREE CATALOGUES.***
- ***PAYMENT:***
  We accept most major credit cards, cash, cheque or monthly terms (APR 23.8% - written quotes on request).
- ***VOLUME DISCOUNTS AVAILABLE:***
  Business, Education and Government.
  Tel: 0181-308 0888.
- ***MAIL ORDER:***
  FREE DELIVERY in UK mainland on orders over £40+VAT. Small administration charge (£2.50+VAT) on orders under £40+VAT.
- ***21 STORES NATIONWIDE.***
  *Mini Stores carry a selected range only but products can be ordered in the stores via Mail Order

MAIL ORDER 0181-309 1111

PLUS TECHNICAL AND HEAD OFFICE

SILICA, SILICA HOUSE, HATHERLEY ROAD, SIDCUP, KENT, DA14 4DX

PLUS BRANCHES AT:

BRISTOL	Debenhams - (3rd Floor), St James Barton	0117-929 1021
* CARDIFF	Debenhams - (1st Floor), St. David's Way	01222 341576
CHELMSFORD	Debenhams - (2nd Floor), 27 High Street	01245 355511
CROYDON	Debenhams - (2nd Floor), 11-31 North End	0181-688 4455
GLASGOW	Debenhams - (5th Floor), 97 Argyle Street	0141-221 0088
GUILDFORD	Debenhams - (3rd Floor), Millbrook	01483 301300
HARROW	Debenhams - (2nd Floor), Station Road	0181-427 4300
HULL	Debenhams - (2nd Floor), Prospect Street	01482 325151
IPSWICH	Debenhams - (2nd Floor), Westgate Street	01473 221313
LONDON	Silica - 52 Tottenham Court Road	0171-580 4000
LONDON	Debenhams - (3rd Floor), 334 Oxford St	0171-580 3000
LUTON	Debenhams - (1st Floor), Arndale Centre	01582 21201
MANCHESTER	Debenhams - (3rd Floor), Market Street	0161-832 8666
PLYMOUTH	Debenhams - (3rd Floor), Royal Parade	01752 266666
ROMFORD	Debenhams - (3rd Floor), Market Place	01708 766066
SHEFFIELD	Debenhams - (3rd Floor), The Moor	0114-276 8611
* SHEFFIELD	Debenhams - (L.Ground), Meadowhall Ctre	0114-256 9779
SIDCUP	Silica - Silica House, Hatherley Rd	0181-302 8811
SOUTHAMPTON	Debenhams - (1st Floor), Queensway	01703 223888
SOUTHEND	Keddies - (2nd Floor), High Street	01702 462426
* THURROCK	Debenhams - (1st Floor), Lakeside Centre	01708 863587

Silica





To: Silica, EDGE-0495-217, Silica House, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND INFORMATION ON THE ATARI JAGUAR

Mr/Mrs/Miss/Ms: .... Initials: ....

Surname: ....

Company (if applicable): ....

Address: ....

....

....

....

.... Postcode: ....

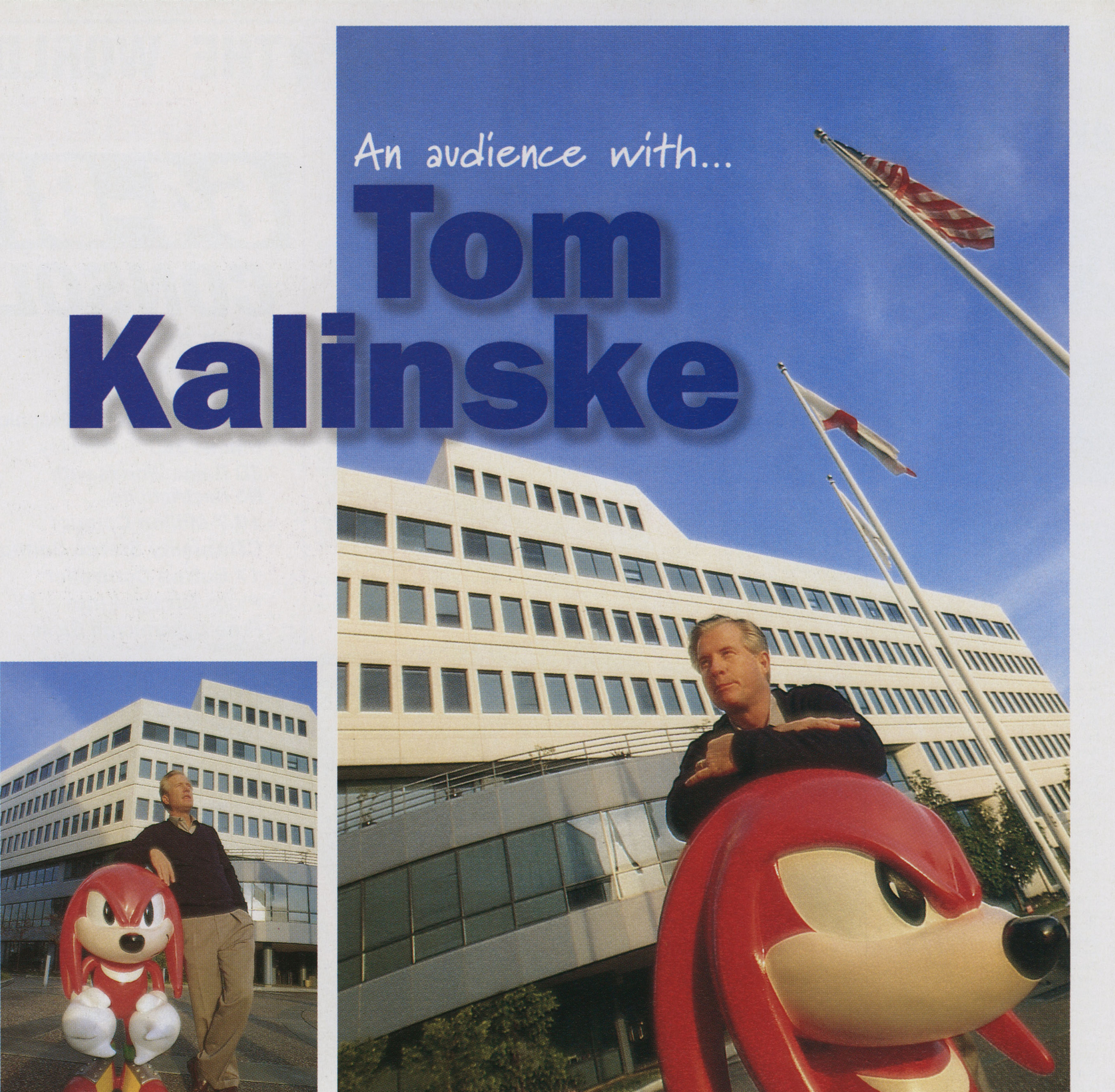
Tel (Home): ....

Tel (Work): ....

Which computer(s), if any, do you own?

.... 217L

E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.



An audience with...

Tom Kalinske

Photographs: **Mark Koehler**

The United States is the crucial territory in Sega's global commercial strategy. **Edge** talks to Tom Kalinske, head of Sega US and the man charged with buttressing its market share against the onslaught to come

Sega hasn't always been the videogames giant it is today. Back in 1990, Nintendo seemed indestructible. The mighty NES had conquered the world, and no-one would have believed that a small rival – with its roots in the pinball industry – could beat the Big N to the punch with a 16bit gaming system. But that's exactly what happened in the US. Nintendo never caught up after Sega's head start and the US is still a market in which Sega holds sway.

But now Sony is threatening to do to Sega what Sega did to Nintendo. And for the moment Sega is pinning all its hopes on the 32X as the weapon to fend off the looming menace of the PlayStation. **Edge** met the boss of Sega Of America, Tom Kalinske, to find out how the company sees its future in an increasingly tough market.

Edge Just as Sega Japan rolled out Saturn, Sega US put all its resources behind the launch of the 32X instead. Does this betray your lack of faith in Saturn?

Tom No, no, I love Saturn. For me, it's a magnificent product. It just all comes down to price, and right now it's not a massmarket item. I was in Japan for the launch of Saturn and it was selling out just as fast as it was arriving in the stores. I'm amazed at how they manage to sell so many of these machines at what are very high prices. But the US is a very different market to Japan and we in Sega USA recognise the importance of proper pricing.

Edge So US gamers have got 32X instead. As you know, Edge has doubts about whether 32X is a wise move: it stretches Sega's resources, it has to be a distraction from the US launch of Saturn and, in all honesty, it's not really that good.

Tom One thing that people don't appreciate is the importance of price to the mass market in this country. The US has always been very, very price driven. To sell huge units of anything – be it TVs, VCRs or cellular telephones – the price must be right. No matter how great Saturn is, or PlayStation is, or Ultra 64 is, we will outsell them by an enormous amount with 32X, simply because of the price. The technology of 32X happens to be pretty good, but the price point is so important in the US market that how good it is really doesn't matter. We've got to have a product out there that the consumer can afford to buy. The thought, 'Let's upgrade the 16bit Genesis they already own to a 32bit experience' was the most logical one.

Edge As opposed to starting over with an entirely new machine?

Tom Sure. Now, later in the year we'll have Neptune out, which is a standalone system for new people coming into the market or people who have owned an alternative system and want to come over. But again, the idea will be to keep the price reasonable enough for the 98% of Americans for whom price is important. That's the real reason behind 32X.

There's a price boundary above which something won't sell. If you look at the history of electronics, the first magic price point is $300. If your product costs more than $300 then your market is very limited. And it doesn't matter what you're talking about – it can be a telephone or a TV. Take audio CD players: they never sold over a million until they got below $300. The same is true for videogames machines. That's why 3DO hasn't been successful.

So that's the first magic price point. It then goes in $100 blocks, so the next would be $199 and then after that $99. And this is the current status of the 16bit business. Both Nintendo and ourselves have been at $99, albeit without a game included. We're both selling huge, huge numbers of units.

Edge 32X was supposed to retail for $10 less than the $159.99 it was launched at in the United States and was also meant to include a bundled game. What happened?

Tom I think it's like anything else. When you design an electronics product you always start higher than where you ultimately want to be at, and then the price always comes down quickly.

'I love Saturn. I'm just amazed at how they manage to sell so many of these machines at what are very high prices'

Edge Presumably you're aiming for a price of under $100?

Tom Sure, that would be great. But I don't think it's realistic.

Edge Do you play games yourself?

Tom Yep.

Edge As a gamer, how do you personally rate the 32X games available so far?

Tom Well, ah… You know, I… The one I like best is *Doom*, that's personally one of my favourite games. And I think it's fantastic that it's the complete game, as I'm sure you know on one of the other systems out there there's no sounds, and I can't imagine a game without sound. It would be like watching a movie with the sound turned off. But obviously I have to play *Doom* by myself. In my family setting I'll probably play *Star Wars* and my daughters are big fans of *Virtua Racing*. And I think that some of the titles coming along will be fantastic. I think, um, *Metal Head* will be great and I happen to think that our golf game…

Edge Can you remember the title offhand?

Tom *Golf Magazine's Freddy Couples' 36 Greatest Holes* – that has to be the longest title! And I know there are a lot of games coming along that I like a lot.

Edge There's no mistaking the pedigree of *Doom* or *Virtua Racing*, but do you think they're impressive from a technological point of view? The action in *Doom* isn't fullscreen and *Virtua Racing* is barely distinguishable form the Genesis version.

Tom Actually, I think *Virtua Racing* is a big improvement – you've got plenty more games options. But you've got to remember that these are just the very first titles. Remember the titles that we first introduced Genesis with, like *Altered Beast*? The improvements that you make from your introductory titles are enormous. And the 32X titles coming out in March and April will be fantastic. We have seen things, internally, that we're working on where 32X titles are beginning to look as good as Saturn games.

Edge Can you name names?

Tom Well, I can tell you one that doesn't quite get there but will be very, very good and be a huge seller and that's *Virtua Fighter*. It will be a terrific title.

Edge Will it make up for *Cosmic Carnage*?

Tom Well, you know, every now and then there are games which we're not so happy with. It's all part of the learning process.

Edge So what lifespan are you looking at for the 32X?

Tom I think three or four years. Looking at Genesis, I think last year between ourselves and Nintendo we sold about 9.5 million units of 16bit hardware. Next year we expect this to drop by about 35%, which still leaves a very big number, and even if it drops further in 1996 it still leaves





Tom Kalinske's stamping ground is Sega USA's headquarters in Redwood City, northern California. It is from here that the launch of the 32X is being orchestrated

Continued next page

interview

a very respectable market. So as long as you have a decent market on Genesis, there's going to be an even bigger market for 32X, trailing a little behind.

Edge When will Saturn launch in the US?

Tom We haven't stated yet. We're in great shape for the launch. *Virtua Fighter* is a phenomenon in Japan, and over here too. I love the game – I actually have an arcade unit at home. We'll be able to launch with both this and *Daytona*, so we're in great shape. But having said that, as with the launch of 32X where I wish we had more titles, I want to have ten great titles at launch and it's this that will determine Saturn's release date. I'm still assuming that it will be the back half of 1995.

Edge Sega pioneered the concept of cool, stylish, brand advertising in the videogames market. As a result, you created a 'Sega Generation' of die-hard Sega fanatics who won't play any other system. Now, these gamers are being pointed in the direction of 32X instead of being kept on a back burner anticipating the launch of Saturn. Is there now a danger that Saturn will launch with no 'instant buyers' to help it through its infancy?

Tom As I said, we certainly intend to sell more 32Xs in 1995 than Saturn machines. And it's not just because we make more money on 32X but because we think we owe it to the userbase of Genesis owners to give them an upgrade path at a reasonable price. And no, I don't think there's any risk. Once we get a chance to explain the whole product portfolio and once we're able to delineate this to all our customers – which we haven't been able to do yet because Saturn isn't actually available yet – then hopefully they'll see that what we're trying to do is provide something for every pocket.

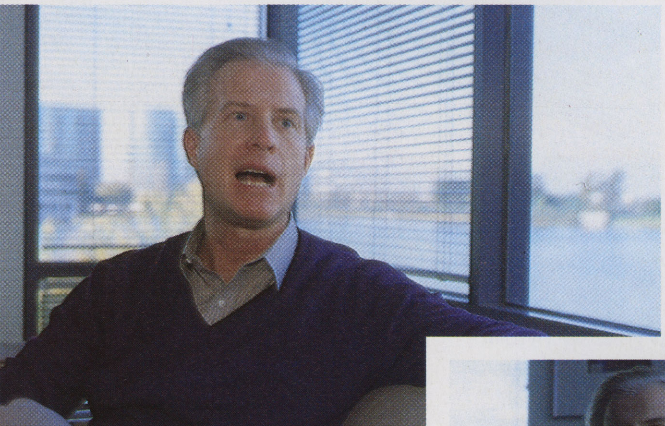
Edge How much of your plans for Saturn's launch are dependent on what Sony does with the launch of PlayStation?

Tom I can't do much about how they're going to price the PlayStation. As you know, in Japan the PlayStation is about ¥5000-¥6000 (£30) cheaper than us, and recently I talked to a number of Japanese retailers and although it was the first weekend of the PlayStation's launch we were still outselling them at a ratio of around 5:3 in general. So we have to assume that the same kind of pricing holds true here, and that there's not much I can do about it. I can't really react a heck of a lot to their lower price. I have to market on the basis of having better titles instead.

'I still feel like an underdog. I've never overcome the sensation that they're going to pounce on us at any moment'

Edge Sega Japan's president, Hayao Nakayama, has been quoted as saying, 'Sometimes we will win and sometimes others will win. For certain we will survive. Whether as number one or number two I don't know.' This a very unusual admission for a Japanese businessman and is – if not exactly defeatist – certainly extremely honest. Are these the words of a frightened man?





Tom Kalinske professes to be unconcerned by the imminent launch of the PlayStation, which he claims is technologically inferior to Saturn

Tom Oh no. Nakayama-san has never been frightened in his life. I think he was just being humble, and if you were to ask him now I think he would tell you that Sega is clearly winning the battle with Sony and that he's pretty happy with the situation.

Edge To what extent is 32X preventing you from reducing the price of Saturn? If you truly believe that 32X is a massmarket item, then surely you don't want to tread on its toes in terms of price?

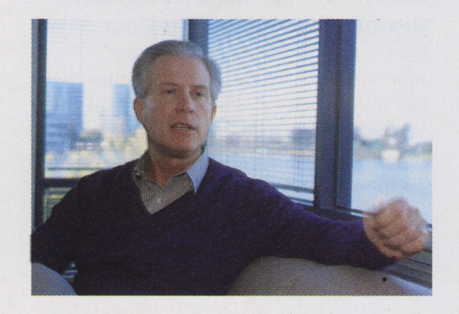
Tom It's not stopping me at all. I'd love to drop the price of Saturn, but its price is dependent on a physical cost and that's why it's been marketed at ¥44,000 in Tokyo.

Edge Will the Saturn released in the US be exactly the same as the machine launched in Japan?

Tom Yes.

Edge What price will it be launched at?

Tom We haven't announced anything yet.



But you know how it usually translates from Japan to here...

Edge So we're still looking at a price of initially around $450. You say your hands are tied in terms of price, but prior to the launch of Saturn and PlayStation in Japan our Tokyo correspondent reported fierce competitiveness between the two

companies. Both held back on prices, both kept shifting release dates and both kept their cards very close to their chest. Can we expect the same level of cat-and-mouse rivalry come the US launch?

Tom I imagine. [Smiles.] Yeah, it's great because we respect our competitors so much and in the case of Sony we're going to keep a lot of things as quiet as possible until we spring them on them, and I'm sure they will do exactly the same to us.

Edge So you're ready for Sony?

Tom I'm ready for Sony, sure. I look forward to the battle.

Edge 32X, Genesis, Sega CD, 32X CD, plus Game Gear, plus Saturn – that's six separate platforms you're committed too. And owners of each of these systems deserve the very best games that Sega can produce. But with six systems in your stable, surely development resources have to be spread perilously thinly? One of Sega's product managers for Sega CD told **Edge** that it's been very difficult getting teams enthused to work on Sega CD games when they could be playing with the sexy new 32bit stuff. Now, on the one hand you say that it's the 16bit games that are mass market and your main focus, but on the other hand it looks like development for Sega CD is in severe danger of being sidelined...

Tom Here's what we're trying to do. When you're doing a title such as *Fahrenheit* or, say, *Wirehead* – titles which involve digitised video – then we'll try and release versions for 32X CD and Sega CD at the same time and in the same box. We're trying to keep the development time of both versions to within two or three weeks of each other to ensure that this trend continues, which should mean that there is a continued flow of quality Sega CD titles.

Edge So that will help ease the burden regarding the number of Sega boxes on store shelves at any one time. But can Sega truly keep on developing killer titles for all its gaming systems?

Tom I think so. As you know, we have expanded here. We have over 350 people and although our main focus remains on Genesis, our people are pretty evenly spread on all the systems – at least now in the first quarter of 1995.

Edge But there can only be one 'A' team. What platform are Sega's hotshots working on right now?

Tom In Japan, the 'A' team is AM2 and last year they were havily involved with getting *Virtua Fighter 2* done. They're also working on versions for Saturn and 32X. But in the US I think we have – I hope – a number of 'A' teams and one of our primary focuses has always been on sports, so we're looking at keeping a lot of attention on making the best sports games we can.

Edge Sega is now a big enough company to do this type of multi-product business, but the flip side is that Sega is no longer the underdog. Isn't there a danger that the same conditions that made Nintendo vulnerable to a lean, hungry, fast-on-its-feet competitor four years ago could now make Sega vulnerable in 1995?

Tom I still feel – and I think most of us here still feel – like an underdog. I don't know why, I've never overcome the sensation that they're about to pounce on us at any moment! And we're up against bigger competitors so how can we not be the underdog? We're up against Nintendo, which is a substantially bigger company and has much more cash in the bank. We're up against Sony and God knows how much cash they have in the bank. So we have to keep feeling that we're the underdog and keep operating in that way. The bottom line is that the two things we do very well are make great games and then market them very successfully. I think if we can continue to do this then we can compete with these guys.

Edge You mention *Virtua Fighter* and *Daytona* for Saturn, while *Virtua Racing* and *Super Star Wars* are two of 32X's main attractions. Is Sega's arcade heritage now paying off when it comes to launching new home machines?

Tom The great thing about our arcade business is that it's like having a huge test market. There are a lot of arcade games that aren't huge hits, and you don't see those translated to the home world. What you see are the huge hits, and this is a tremendous benefit to us. Then there's the technological advantage that having an arcade division brings, and a lot of lessons learned in the coin-op business have helped the development of our home systems.

Edge What, in your opinion, are the strengths and weaknesses of your rival systems? 3DO, for example?



Sonic established Sega as a major force the US videogames arena. The company will be hoping that forthcoming Sonic games on the 32X and Saturn will help it maintain that position

Tom I've been very consistent on this subject. While I happen to like Trip Hawkins very much as a person, I don't think the strategy has worked and I don't believe he will ultimately be successful. The sales of under 100,000 in the US everyone recognises as a failure. I've heard that he has sold 150,000 in Japan but I've also heard that since the PlayStation and Saturn came out, sales of 3DO have stopped dead. Since last weekend when I was in Japan, the 3DO machines have been moved to the back corners of the shop – they're not on prominent display any longer – and I think this is an accurate indication of its new status. It simply doesn't compete.

Edge So you believe that – in Japan at least – 3DO's window of opportunity has just slammed shut?

Tom Yep, it's now passed by.

Edge What about the Jaguar?

Tom I don't believe the current Jaguar is

Continued next page

powerful enough to compete with the new machines and there's not enough great software out there to support it. They've done a better job recently of getting some other decent games out for it but it's not enough to save it. It's too little, too late.

Edge What is the current relationship between Atari and Sega following the patent settlement?

Tom We're certainly friendlier! We're a stock holder in the company and we have both agreed to cross-license from each other, so we are looking at the library of old Atari titles and seeing if they make any sense for releasing on any of our platforms and they are looking at some of our titles to see if they make sense for Jaguar.

Edge Can you name names?

Tom No, nothing's been decided yet.

Edge Neptune, when launched, will be competing toe-to-toe with Jaguar. Both are cartridge-based machines priced at around $200. How will Sega's machine compare?

Tom Well, our big advantage there, of course, is the enormous library of existing games, with more on the way.

Edge What about the biggest rival of all, Sony? Although it's a newcomer to the world of videogaming and it hasn't always been successful at launching new gizmos in the past, it has a very powerful machine and considerable resources.

Tom I don't know anything of their US plans. They certainly aren't confiding in me what they have up their sleeves! I've heard a lot of different rumours, and of course I respect them for what they are: a very strong, big, hi-tech electronics company. But they have failed a few times with consumer products – we all remember Betamax – and so we're all hoping that the PlayStation turns out to be another Betamax and that in a couple of years' time we'll be able to tell people to play their Saturns on a Sony TV.

Sega has hitherto depended on the youth appeal of cartoon characters like Sonic and Knuckles. But the company is now committed to expanding the market by targeting older people

Edge The Betamax analogy is mischievous, because Betamax was actually technologically superior to the VHS system which overtook it…

Tom Yes it was, but it wasn't successful.

Edge So would you rather be successful than superior?

Tom Hmm. From what I've seen, I would say that we have superior technology. Who knows whether they'll come up to our level a little way down the learning curve? But from what I've seen now, they have a lot of titles out that don't make any sense, so I think that we are ahead of them in the software line-up area as well.

Edge How are you faring in the battle with your old rival, Nintendo?

Tom Who? [Laughs.] The current battle is being fought between Genesis and the SNES for 16bit superiority and we're still beating them in share of market and there's nothing that they could have done to overtake us this year. They did a good job – and I must give them credit – on *Donkey Kong Country*, and they did a great marketing job. But even with that we will outsell them on both hardware and software this year. In terms of the future, we think we will continue to beat them with a broader and better software library.

Edge What about Ultra 64?

Tom I just don't believe in the longterm health of a high-priced cartridge-based business. I think that at some point you have to convert to CD-ROM. I know they claim they have this wonderful compression scheme, but so do we. Everyone has wonderful compression schemes, but the bottom line is that you end up with these high-meg cartridges that cost a lot of money, so the price ends up too much for the consumer and the revenue ends up too small for the thirdparty manufacturer or, indeed, the parent company. So I think Nintendo's current strategy for the Ultra 64 is incorrect and may in fact be subterfuge – maybe they really are planning on bringing out a CD drive for the Ultra 64 which will bring the price of the machine up to the same price as everyone else's.

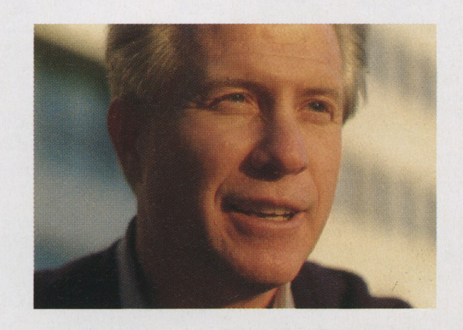
The other problem, of course, is that how are you ever meant to do more than what you're doing today on cartridges if you don't move to CD? How do you ever really incorporate the wonderful things you can do with film, special effects and Silicon Graphics computers if you don't move to CD-ROM?

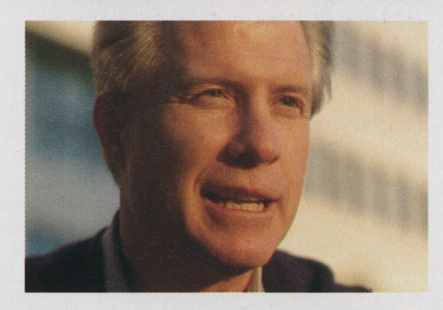
Edge How does the Sega Channel fit in with Sega's longterm plans? Is the goal to eventually replace cartridges and CDs with games on demand via cable?

Tom No, no. The latest research shows that – aside from the fact that a lot of people want to sign up for it – people who sign up for the Sega Channel actually buy more software at retail than people who don't subscribe to it.

We think that this is because we show them new titles on the Sega Channel and they get excited about it and go buy them. Also, people fall in love with a game on the Sega Channel and then, when the selection of titles is rotated each month, they find that they can't play it any more and so

'I don't believe Trip Hawkins will be successful. The sales of 100,000 in the US everyone recognises as a failure'





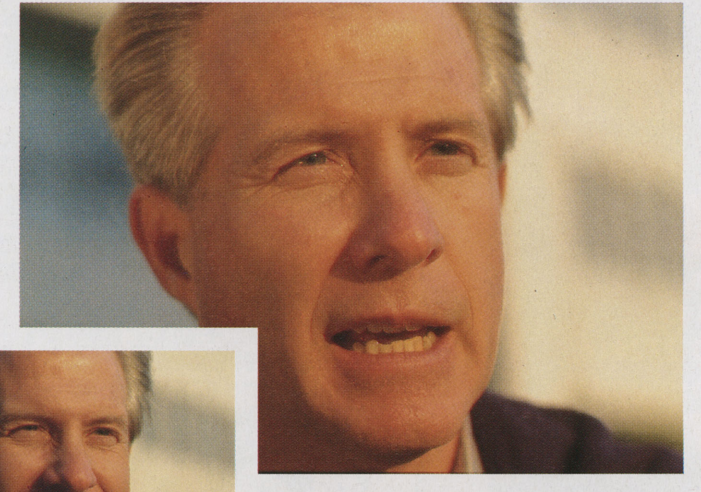
maybe that drives them to a retail shop to buy it.

Edge So Sega is not only getting the benefit of revenues from the Channel itself but is consequently selling more 'conventional' games?

Tom That's right. And I think another big advantage is that the Sega Channel helps keep the Sega brand at the top of people's minds and it keeps the brand cool.

Edge The Sega Channel is pioneering, but its lifespan is critically limited because it's not interactive: it's just a constant supply of games into the home with no feedback from the 'viewer'. Nintendo has plans for its Gateway system, 3DO is heavily involved in its US West trial – both of which are fully interactive systems – so what is Sega doing to jump onto the interactive information superhighway?

Tom The Sega Channel is only limited because it's here today using today's technology. And certainly we're really interested in the future of gaming networks. We've been big supporters of Catapult Entertainment's X-Band system and we hope that it will grow to be a successful, low-tech solution to interactivity. Aside from that, you kind of have to wait for the infrastructure before you can do it properly. The big problem I have with it is that it will not happen next year or the year after. I think we'll really have to wait until at least 2000 before the infrastructure is in place.



The accepted wisdom at Sega US is that America is not yet ready for Saturn. However, confidence in the 32X seems to be riding high

Edge Sega seems to have its fingers in all sorts of pies right now. As well as the six different home consoles, there's the arcade business, a new merchandising business, plans for amusement centres and even theme parks. Is there a danger of Sega losing its focus?

Tom The overall goal is to lead in interactive entertainment both in and out of the home. And we believe that hi-tech theme parks offer a big opportunity to us as a company. I don't think we're up against Disney or MCA in this category. We're doing something quite different. We're going to offer an all-weather, all-year-round venue for adults, children and kids to go to together more than once a year. At the moment you only go to Disney World maybe once a year, but Sega's planned facilities are such that families can visit every weekend and have a new, exciting experience each time – as long as we change the software regularly enough. And the great thing is that what we do here cascades down into our arcade business, and then into the Saturn system – which is damn near equivalent to our arcade systems – and the other home systems.

Edge How else is Sega going to expand the games market? Pretty much every male teenager in the United States is a videogame fan, but for your business to continue growing you need to attract a wider audience. How are you planning to do this?

Tom Yesterday I looked at the first commercial we've specifically targeted at women. It goes into advertising research this weekend and we hope to have it on the air early this year. But you're right, we have to find a way to get women playing videogames and obviously there are a number of problems that you have to overcome. Firstly, for a lot of women, playing against a male is very intimidating – you know that the guy's going to beat the hell out of you and you won't have a chance. Secondly, we have to provide gaming experiences that are more enjoyable for women. Now, 25% of the players of the Sega Channel – during our tests – were women, which is significantly higher than the percentages of ordinary home systems, in which there are just between 15% and 20% women. And what that's said to us is something that we've known all along and that is that women and girls want to play videogames, but there's something intimidating about the current experience that doesn't facilitate them. There's a big opportunity there.

The older market we're targeting pretty well already. We think that the key for this group is sports, and we figure that the more realistic we make sports games, the wider their appeal will spread to an older audience.

Edge To what extent will Saturn be targeted at newcomers to videogames?

Tom I think you'll see a lot of that happening because they'll see how it looks and plays, but I do think that the majority of our sales will initially be to experienced gamers. Having said that, we do expect Saturn to attract a much older audience. In 1994 over 40% of our Genesis sales were to people 18 or over and you can only imagine who'll buy Saturn – I wouldn't be surprised if everyone who bought it was over 18.

Edge Because they're the ones with enough cash to afford it...

Tom Absolutely.





London

REPLAY

Importers Of Console Games & Accessories

SEGA SATURN, SONY PLAYSTATION, FAMICOM, ATARI JAGUAR, NEO GEO, 3DO

STOCKISTS AND DISTRIBUTORS OF THE FIRE RANGE OF ACCESSORIES.

SONY PLAYSTATION + RIDGE RACER CALL!!

ALL PLAYSTATION SOFTWARE AVAILABLE CALL FOR PRICES

SEGA SATURN (RGB) + 1 PAD AND VIRTUA FIGHTERS CALL!

QUALITY POWER CONVERTOR (110V) ONLY £27.99

NEO GEO CD + 2 CONTROLLERS AND ONE GAME (Choice of 3 titles) £399.99

NOW YOU CAN AFFORD THE GAMES OVER 40 TITLES IN STOCK PRICE FROM £29.99

PANASONIC 3DO SOFTWARE LATEST TITLES (U.K & IMPORT) FROM £29.99

No 3 Market Street, Heckmondwike
West Yorkshire WF16 0JY

TEL/FAX 0924 402244



Bucks



Specialist in SNES backup devices
Next Day Delivery Guaranteed

USA Gold Star 3DO £Call
3DO Games All £35
Need For Speed
StarBlade
Rebel Assault
Samurai Showdown
SSF IIX, FIFA
Off World Interceptor
Demolition Man + More

Sega Saturn + 1 Game £499
Clock Work Knight
Victory Goal
Myst
Virtua Fighter
Panzer Dragon

Sony Playstation £Call
Tohshinden
Cyber Sled
Motor Toon + More

32DX S.W.C. £Call for details

31/2 HD 100% Grade A Disks only 40p each.
1 Ribble Cres, Bletchley
Milton Keynes MK3 7QF

Please make cheques payable to
WILD CONSOLES

Birmingham

Dynamic Consoles 0121 628 5715

Sony Playstation Includes Ridge Racer & 12 Months Guarantee	£Call
Latest software available includes	
Toh Shin Den	£60
Motortoon	£55
Cybersled	£60
Raiden	£Call
Starblade	£Call
Philosma	£Call
Kileak The Blood	£Call
Boxing History	£Call
Victory Goal (Saturn)	£Call
Sony Joypad	£45
Memory Card	£25

Call waiting system in operation.
Post & Packing
£10 Consoles £1·50 Games.

Cornwall

CONSOLE CONNECTIONS

Introducing the world's FIRST 3DO Infra-Red Joypad

3DO

STEALTH

* Complete with X 2 PADS and a Receiver
* No messy wires
* Latest Infra-Red Technology enables a range up to 18 metres
* Can be used at ANY angle of 360° within 6 metres
* Low power consumption
* Auto battery saver
* Slow Motion
* Independent turbo control
* Compatible with all 3DO systems

ONLY £39·99 + £2·00 P&P

MAIL ORDER: 0872 261065
SHOP & MAIL ORDER
CONSOLE CONNECTIONS
19 KENWYN ST, TRURO,
CORNWALL TR1 3BU

SWITCH Access VISA AMERICAN EXPRESS

Trade enquiries WELCOME

Dorset

VIDEO GAME CENTRE

We have a huge range of new & used consoles, games & accessories including new & rare imports from Japan and USA.

Megadrive, Mega CD, Sega Saturn, Sony Playstation, Super Famicom, Nes, Gameboy, Jaguar, Lynx, 3DO, PC Engine, Turbografx, Neo-Geo

888 Wimborne Road, Bournemouth BH9 2DR
Tel/Fax: 0202 527314

Access VISA

Kent

LOADED CONSOLES

14 Medway Meadows, East Peckham, Tonbridge, Kent TN12 5HJ

NEO GEO

Art of Fighting/Fatal Fury 2 Pack ..... £389·99
Back catalogue CD games ..... £29·99 – £49·99
New Releases:
A.D.K – £54·99, Street Hoop – £49·99, Flying Power Disc – £49·99
King of the Fighters '94 – £54·99, Samurai Showdown II – £59·99
Coming Soon; Fatal Fury 3, Super Sidekicks 3, Zed Blade, Galaxy Fighters, Pozzle Bobble, Viewpoint, Art of Fighting 3.
✷ We also stock a large range of new and used Neo Geo Cartridge games ✷

3DO

Panasonic 3DO (New Model) ..... £Call
Goldstar 3DO ..... £Call
Goldstar F.M.V Unit ..... £Call
NTSC T.V Adaptor ..... £59·99
✷ We stock a large range of new and used, UK and US software ✷
Coming Soon: Gex, Wing Commander III, PGA Tour Golf, 3DO Doom.

SEGA

Sega Saturn Core Unit ..... Call for current price
Releases for Feb/March:
Victory Goal – £Call, Pebble Beach Golf – £Call, V Hydlide – £Call, Daytona USA – £Call, Shinobi – £Call

SONY

Sony Playstation Core Unit ..... Call for current price
Feb Releases:
Philosonia – £Call, Starblade – £Call, Cyber Sled – £Call, Boxer's Road – £Call, Raiden Project – £Call

NEC PC-FX – Call for details

WE BUY USED 3DO, NEO GEO AND SUPERGUN SOFTWARE

TEL: 0622 871544
0378 549398

Trade enquiries are always welcome

questiontime



Send your **questions** to Q&A, **Edge**, 30 Monmouth Street, Bath, Avon BA1 2BW

Q I was just reading Ultimate Future Games andthey said they've heard that Sega may well be releasing the Saturn early in the USA – in March – and if that happened, Sony would do the sensible thing and release the Playstation there too to avoid losing out. Now, wouldn't it be prudent for both companies to release their consoles in the UK and Europe too, as the magazines are doing a bloody fine job of promoting both machines?

Chris Farmer, Oxford

A There's no way that the Saturn will appear in either Europe or the United States until at least the autumn of 1995, and possibly even later. Until then – and beyond if we believe what Sega is telling us – 32X will be the focus of Sega's strategy.

Q I am thinking of buying a Neo-Geo CD console, but I have a few questions about it that I hope you can help me with.
1. Is it worth buying this four-year-old 16bit machine in the light of the imminent arrival of the 32bit Sony and Saturn?
2. Will Japanese games be compatible with the British PAL console, and vice versa?
3. I have a TV with standard RF and SCART sockets. Is it better to buy the PAL or the NTSC machine?
4. Has the Neo-Geo still got a good life ahead of it or is SNK just flogging a dead horse?

Darren Roberts

A **1.** The Neo-Geo CD has a high-quality selection of 2D beat 'em ups and baseball games, so if you like those genres you're laughing. There don't seem to be that many other types of games on the horizon just yet, but expect some announcements about new software soon.
2. Yes, there's no encryption in Neo games, but you'll get a letterboxed display on titles that haven't been modified for a PAL fullscreen display.
3. The NTSC machine is arguably better because it runs on 60Hz and a SCART lead allows it to run on most UK TVs with SCART sockets.
4. Only SNK knows how long the Neo-Geo CD will last. The hardware is getting on for five years old and yet its 2D performance is still respectable enough to power SNK's new coin-ops. However, with many sprite-based games now looking jaded beside the polygon-packed extravaganzas on the Saturn and PlayStation, the appeal of the Neo-Geo CD could soon start to wane. Of course, the hardware could deliver so much more than just beat 'em ups, but without creative thirdparty developers its future will remain uncertain.

Is SNK really 'flogging a dead horse'? (See letter from Darren Roberts)

Q **1.** I am interested in *Doom* and flight sim-type games on the PC. Will *Dark Forces*, *Little Big Adventure* and a flight sim like *TFX* be appearing on the 3DO?
2. Will a mouse be supplied for the 3DO?
3. Can the 3DO produce graphics like texture mapping and Gouraud shading as well as the Playstation, Saturn or PC?
4. When will the Saturn and the Playstation be released officially in this country?

Sebastian Barquin, Staffs

A **1.** *Doom* and *Doom II* are both being converted for the 3DO, and a flight sim – *VR Stalker* – is available now.
2. There's one available in Japan, and it's scheduled to appear in UK shops in the near future.
3. The 3DO is fairly adept at texture mapping, but with only a 12.5MHz ARM 60 at its core there simply isn't the power to calculate large amounts of complex geometry. For example, in games like *Road Rash* you'll notice that roadside detail and other cars are constructed from scaling bitmaps instead of polygons. The 3DO's polygon count will increase massively when the M2 upgrade arrives at the tail end of 1995.
4. Sony claims that it will have its machine in the shops for September, while Sega is still only committed to the less specific 'fourth quarter, 1995'.

Q **1.** In the chip breakdown for the Sega Saturn (**Edge** 16), you state that the central processors run at 2.5 million instructions per second. If the chip's clock speed is 28MHz, does this not imply that it runs at 28 million instructions per second?



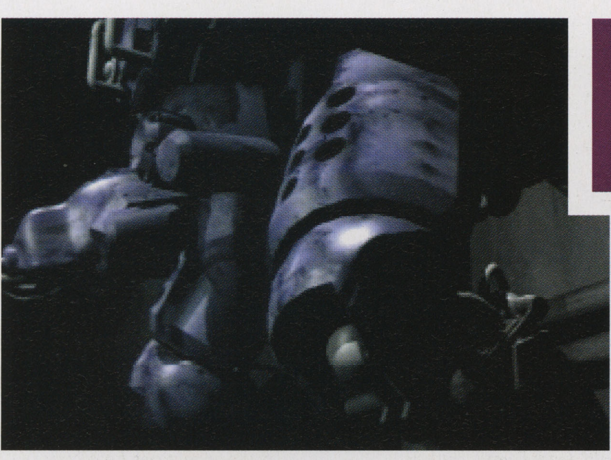
A range of 3DO accessories is now available in Japan (see letter from Sebastian Barquin)

2. You also state that JVC, Yamaha and Hitachi will release versions of the Saturn. Will any of these versions be officially imported into the UK?
3. Is Sega likely to follow 3DO's lead and license its technology to companies like Creative Labs? It could then produce a Saturn blaster card. If this board was released at approximately £100 to £150 less than a complete Saturn console, Sega would have an established PC userbase to sell software to.

Clint Stallard, East Sussex

A **1.** It should have read 25 million instructions/sec, or 25MIPS, as was printed immediately before it. A 28MHz chip doesn't necessarily result in a rate of 28MIPS – in most chips it often takes more than a single clock cycle to execute one instruction.
2. JVC is considering releasing the V-Saturn in the UK.
3. It's possible that this is already on the cards, but the transition from gleaming new Saturn box to unwieldy plug-in printed circuit board isn't something that fits snugly into Sega's commercial ideology. A Sega-branded Saturn PC wouldn't be that hard to envisage, though, even if the previous two attempts at marrying Sega technology with that of a computer – the Amstrad Mega PC and the Japanese-only Tera Drive – both failed dismally.

Q I currently own a Philips CD-i player and am ready to upgrade. The problem is that I have a number of digital video films as well as quite a few Photo CDs, so I need some advice.
1. Are the PlayStation and Saturn able to display Photo CDs?



The PlayStation's outstanding video playback system is shown by the animations in *Kileak The Blood*... (See letter from Gary Holden)



... while the system's NTSC signal still causes problems for those without the state of the art in multistandard TVs (see letter from Surjit Patel)

2. Is an MPEG decoder planned for any next-generation console?
3. If I purchase an imported next-generation console, will British games be able to run on it as they become available?

Gary Holden, Stockport

A **1.** No.
2. The PlayStation will definitely not be playing host to an MPEG adaptor, as Sony recently announced a new standard for digital video, HDCD (or DVD, as Sony is calling it). Besides, the PlayStation's MDEC video playback system is so proficient that the machine doesn't really have any need for MPEG. The Saturn, on the other hand, will be following the MPEG trail, with an adaptor to be released in time for the US and European launches.
3. No, but apparently it will be possible to convert the Saturn to run UK software. Sony, however, is adamant that its software encryption will fox the importers. We'll see.

Q **1.** Do you know if there are any Formula 1 racing sims being developed for the PlayStation?
2. Sony has 700 development kits in service around the world. What is a Sony development kit?
3. The PlayStation can draw 1.5 million polygons per second. Why only 180,000 polygons per second for *Ridge Racer*?
4. When is Namco going to be making a reactive steering wheel for PlayStation driving sims and how many thirdparty hardware companies are making peripherals for the PlayStation?
5. What arcade companies will be using the PlayStation chipset as their platform and is it the same as the one found in the PlayStation sold to consumers?

Jay Saka, Canada

A **1.** Sony's first ever graphic demo for the PlayStation was a stunning pre-rendered racing sequence, but it's not known if there are any in-house plans for an actual game. What is known, though is that US developer Papyrus is working on a PlayStation version of *IndyCar* and Namco has a conversion of *Ace Driver* scheduled.
2. It used to be a large beige box resembling a PC case but it has now been scaled down onto two boards that fit inside a normal PC. Next issue **Edge** will have full information on Sony's development hardware.
3. The 1.5 million figure only applies to the GTE (Geometry Transfer Engine) – the silicon that calculates the geometry. Even then, this is a misleading figure and bears little relationship to the number of polygons the PlayStation can actually *draw*. The polygon count for PlayStation *Ridge Racer* has never been revealed by Namco. As **Edge** has pointed out many times, establishing polygon figures is a highly subjective art and can vary according to a multitiude of factors, such as size, shading, textures, colour resolution, etc.
4. The Negcon, Namco's solution to the inherent drawbacks of digital feedback devices like joypads, is an attempt to give players the same control provided by a steering wheel. It isn't known if Namco has a more ambitious steering wheel planned. Sunsoft, Hori and Ascii are all producing joypads and joysticks for the PlayStation.
5. Only Namco and Konami are currently using the PlayStation chipset to develop arcade games, although it's thought that Data East originally expressed an interest. The Williams/*Mortal Kombat* deal looks like it has been turned on its side, though: the last thing **Edge** heard was that the game wouldn't use the PlayStation chipset in the arcade but instead would be based on Williams' own custom board, like the first two coin-ops.



The Negcon for the PlayStation provides analogue control (see letter from Jay Saka)

Q Brilliant Magazine. The playboy of the technology scene. You can look but you can't have. But I've decided to 'have' one, so I have a few questions that need to be answered. I've sorted out the import details and the duty that needs to be paid on it. But the only question I need to get answered is this: do I need a NTSC-PAL converter or can I pull an RGB signal off it and feed it into the SCART on my telly? If this involves soldering, etc, that's no problem as I work with some very bright hardware engineers. Or can I get a lead that connects the Sony AV port to the SCART? Please help. In the great scheme of things it's not that important I suppose but it would help me to decide whether to wait for a UK one or go ahead with getting a friend to bring me one over.

Surjit Patel, London

A Are you talking about the PlayStation or the Saturn? It's easy to hook the Sega machine up to a SCART TV – unofficial leads are available from importers. The PlayStation, on the other hand, is still causing problems because Sony hasn't yet got around to releasing its RGB SCART lead. Until now, most importers have sold machines with the option to buy an NTSC converter. However, although these work fine, the picture quality is less than perfect, usually suffering from a lack of colour and definition. To counter this problem, some importers are now hard-wiring the machine to RGB for a SCART connection.

It's not worth getting a SCART lead that connects to the composite AV port (the yellow RCA jack) on the back of the machine – all you'll get is a black-and-white picture because the colour component of the signal is still coded for NTSC display.



Q and A

You can rely on Edge to cut through the technobabble and give you straight answers. Write to: Q&A, Edge magazine, 30 Monmouth Street, Bath, Avon BA1 2BW. Alternatively, fax us on 0225 338236, or e-mail us at edge@futurenet.co.uk.

Edge regrets that it can't answer questions personally, either by phone or by post.

next **month**



Sony's PlayStation hardware may be unchallenged at the moment, but what will really make the system viable is software support from thirdparty developers prepared to make a longterm commitment to it.

Next issue **Edge** delves into the heart of the PlayStation development community and reveals exactly what Sony is doing to endear programmers to its system as well as make the process of designing PlayStation games as streamlined as possible. Issue 20 will contain a complete technical breakdown plus opinions from worldwide development talent and an interview with the designer of the PlayStation himself, Ken Kutaragi.



Thursday 30 March


EDGE



Your guarantee of value